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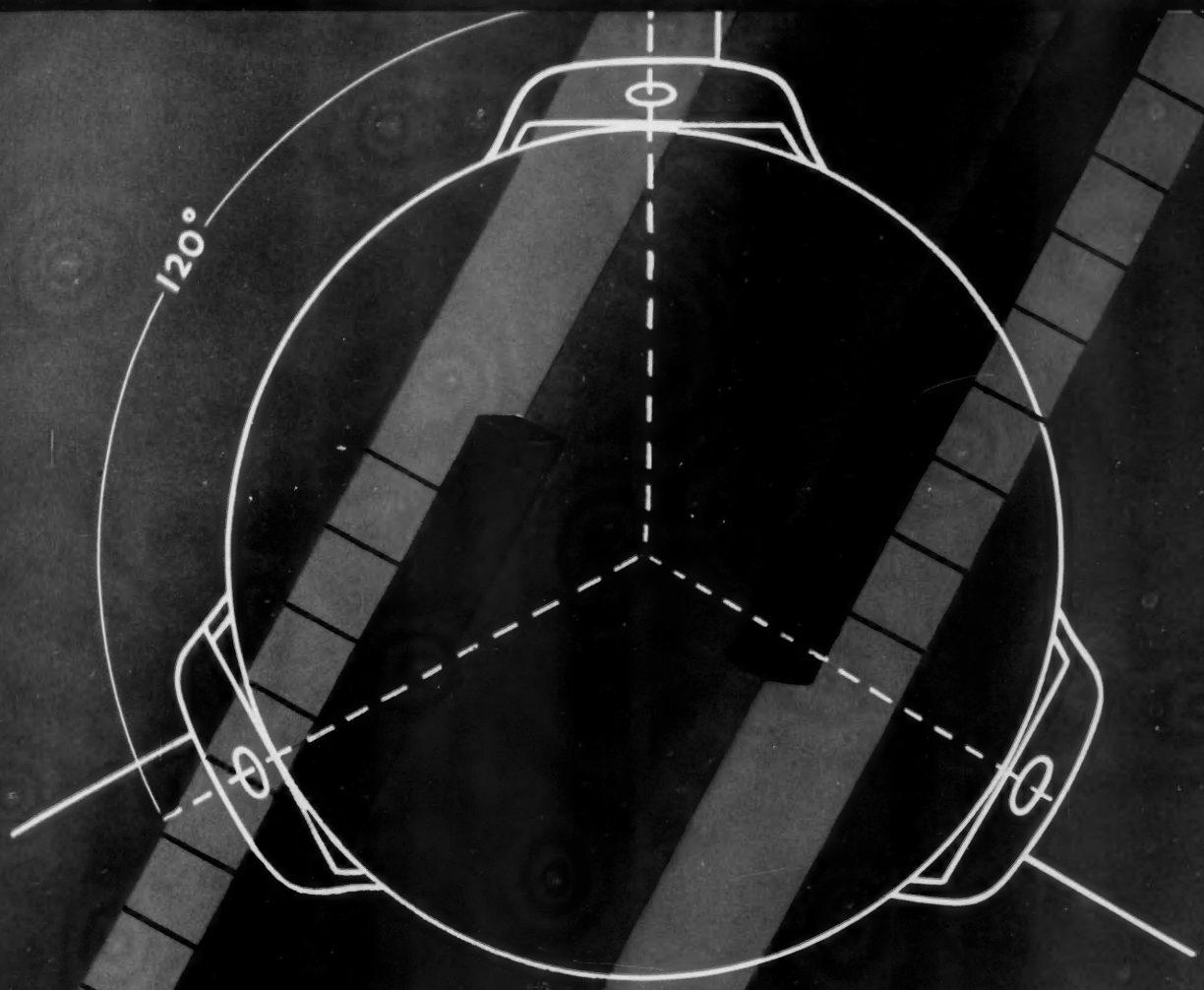
The OIL WEEKLY

FOR THE DRILLING PRODUCING AND PIPE LINE INDUSTRY



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ROTO-WALL CLEANER

(for Removing Filter Cake and Centering Casing)

The Howco Roto-Wall Cleaner was designed to handle both the removal of filter cake from the well and the centering of casing, without restricting the flow area of the cement slurry.

The arrangement of the two rows of specially designed cleaning spikes and the staggering of the sections of cleaners used provide a "free flow" of fluid past the cleaner sections without creating an obstruction in the annular space of the well bore, which otherwise might cause a bridging action during the course of the cementing job.

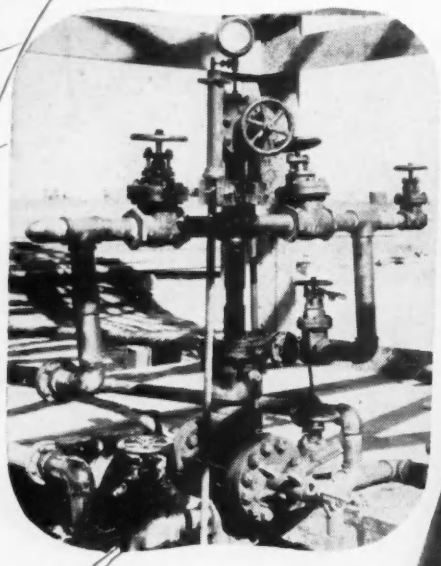
For further information on the Howco Roto-Wall Cleaner, consult the nearest Halliburton representative, or write for bulletin.

HALLIBURTON OIL WELL CEMENTING CO.

DUNCAN, OKLAHOMA

CENTS PER COPY January 20, [illegible] VOLUME 124, NUMBER 3

great TREES from little acorns . . .



1922

A Cameron Christmas Tree installed on a Gulf Coast well in 1922.

1946

Cover illustration of the new Cameron Catalog showing a Cameron 15,000 Pound Test Christmas Tree installation.

CAMERON'S experience in well completion equipment dates from the early twenties when flow-lines were big and un-choked and threaded connections provided an ample factor of safety for the highest pressures encountered. It was then that the first Cameron Ram-Type Tubing Control Head—patterned after the Cameron Blowout Preventer—appeared in the field. In the intervening years . . . an era of the industry's most vigorous growth . . . thousands of wells have been completed with the aid of this unique tubing head, including most of the record depth and high pressure wells drilled to date. Whether your operations are in low or high pressure fields, single or multi-zone, specify Cameron Ram-Type Tubing Control Heads and Safety Christmas Trees to assure the ultimate in safety and flexibility.

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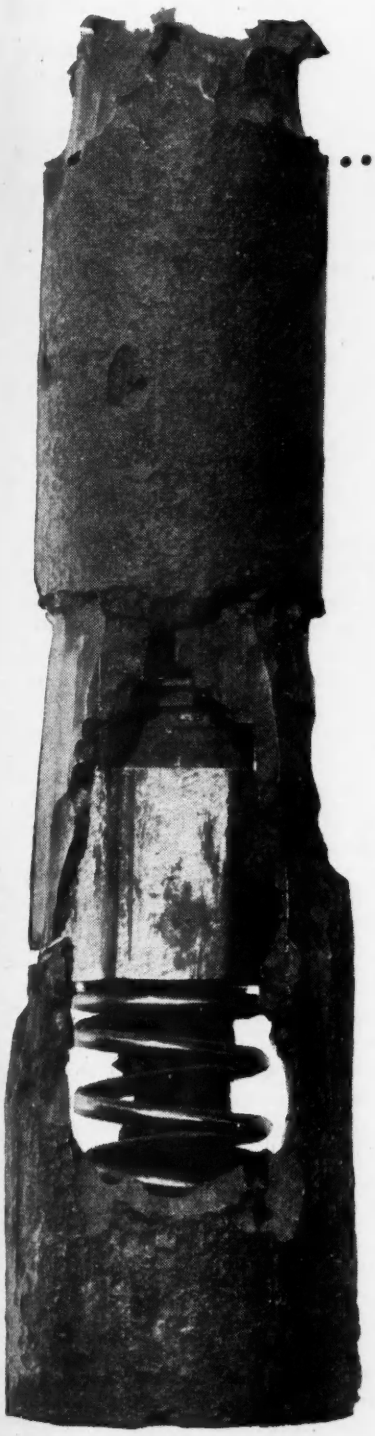
CAMERON SAFETY CHRISTMAS TREES

How to select spring alloys

... that withstand { FATIGUE / HIGH TEMPERATURES / CORROSION



STANDING VALVE PULLER
manufactured by Harbison-Fischer Manufacturing Co., Ft. Worth, Texas, after 104 days' actual run in a West Texas well. The Monel spring is in excellent condition.

Two different metals went into this standing valve puller. See how badly the steel crown has been eaten away by a 104-day run in sour crude.

Now, note the excellent condition of the *spring*.

Corrosion failed to obtain a toe-hold, for this spring is made of Monel, the Nickel Alloy which stands up where many other metals fail.

Perhaps the springs in some of *your* equipment would last longer or perform better if they, too, were made of Nickel or Monel*... or of one of the other nickel alloys such as Inconel*, "K" Monel* or "Z" Nickel*.

All are rustless. They resist sagging and distortion under load. They combine great strength and toughness with resistance to temperature extremes, and to corrosion, abrasion, shock and wear.

In addition, each has certain *extra* properties which make it possible for you to select an alloy having just the *combination* of properties you need.

For example...

Do you want a spring with exceptionally high strength? Then consider "Z" Nickel. By heat-treating, its tensile strength can be developed to upwards of 200,000 psi.

Want a combination of strength, corrosion resistance and *non-magnetic* qualities? "K" Monel is your answer. Does your problem involve *oxidation*, or high temperature weakening? If so, Inconel is the metal to use.

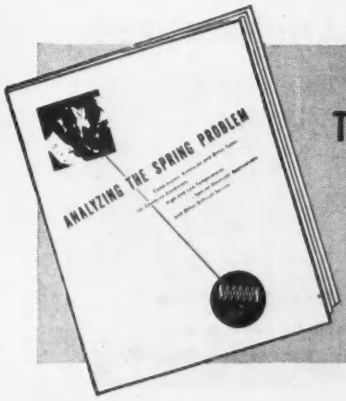
* * *

When you're trying to find a spring material capable of doing a job better—or longer—a copy of the question booklet prepared by INCO's Technical Service Department may come in handy. It's called *Analyzing the Spring Problem*. We'll send it along promptly and without obligation upon receipt of your request.

**Reg. U. S. Pat. Off.*

NICKEL (INCO TRADE MARK) ALLOYS

THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall Street, New York 5, N. Y.



THIS BOOKLET CAN SIMPLIFY YOUR JOB
of matching spring material and spring design to meet your exact requirements. It's free. Write for your copy.

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Thermoid

Powerflex Rotary Hose

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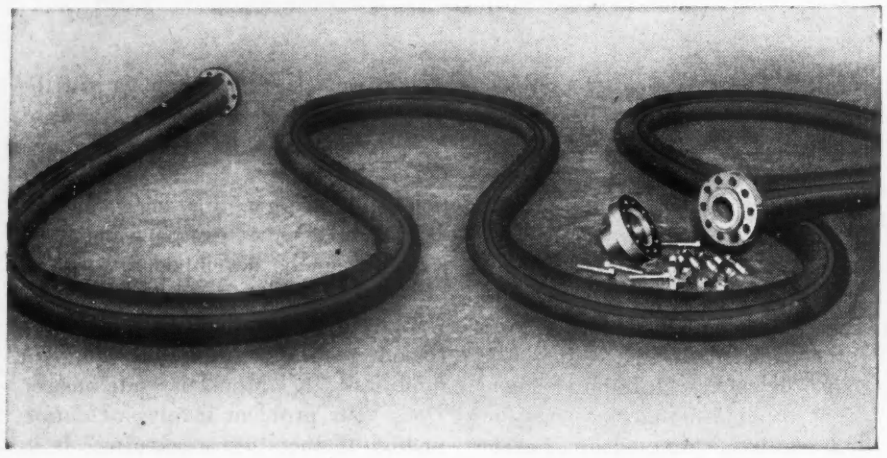
from factory or warehouse



Strength *plus* Flexibility

This fifty-foot length of 3-inch Thermoid* Powerflex Rotary Hose snaked out shows no strain or kink in the hose at any time. Thermoid Powerflex PRESSURE SEAL Rotary Hose can be coiled into smaller diameter without injury than any type of rotary hose — whether light or heavy duty.

*Formerly Grizzly

THERMOID PRODUCES AND SELLS MORE ROTARY HOSE THAN ANY OTHER MANUFACTURER

Rotary Brake Blocks—Woven Oil Field Brake Linings—Slush Pump Hose—Flexible Discharge Unit Hose—Production and Refinery Hose of all types—V-Belts and Drives—Oil Country Belting—Stuffing Box Rings—"No Wip" Line Savers—Wire Line Turn Backs—Pin Type Pipe Protectors—Molded Products

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Looking Ahead

WITH THE EDITOR

MANY Oil Weekly subscribers are interested in our reports on rigs running, rigs standing, etc. And many of them want to know if they are rotary rigs or cable tool rigs. In our annual YEARBOOK-FORECAST issue of THE OIL WEEKLY, to be published February 10, 1947, we shall publish a table showing the detail on such rigs by active drilling areas. Watch for it. Remember the date—February 10.

One of the most valuable features published annually in an oil paper (yes—it is an exclusive OIL WEEKLY feature) will be our record of new fields, new producing horizons, and important extensions, which will occupy about 12 pages in our annual YEARBOOK-FORECAST issue.

This record will show not only the company opening the new field or deeper producing horizon, but the location of the well, producing formation, depth, initial production, and data as to its importance and its status at the beginning of the new year. If somebody says "There were only two new fields found in California during the year and none of them were good," you can hand them the actual facts from this feature of the YEARBOOK-FORECAST issue.

GEOLOGIC investigations of the world's petroleum resources indicate that vast reserves lie beneath ocean waters adjacent to many of the land masses. In days gone by, the oil industry always managed to develop methods and equipment to drill wherever the geologist pointed.

With the ever-increasing demand for more petroleum reserves, the search for oil is being extended to the continental shelves. For more than a year, increased activity has been directed to the development of ways and means to successfully exploit these potential sources of oil. Latest in the development of structures on which to locate drilling equipment in deep, open water is described in next week's issue of THE OIL WEEKLY in an article by Edward R. Armstrong entitled, "Seadrome-Type Offshore Foundation for Continental Shelf Operations."

Specialized Oil Publications of
THE GULF PUBLISHING COMPANY
Box 2608, Houston (1), Texas

The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipe line industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

Member Audit Bureau of Circulation and Associated Business Papers, Inc.

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The OIL WEEKLY

ENGINEERING NEWS STATISTICS

R. L. DUDLEY, President, Publisher A. L. BURNS, General Manager

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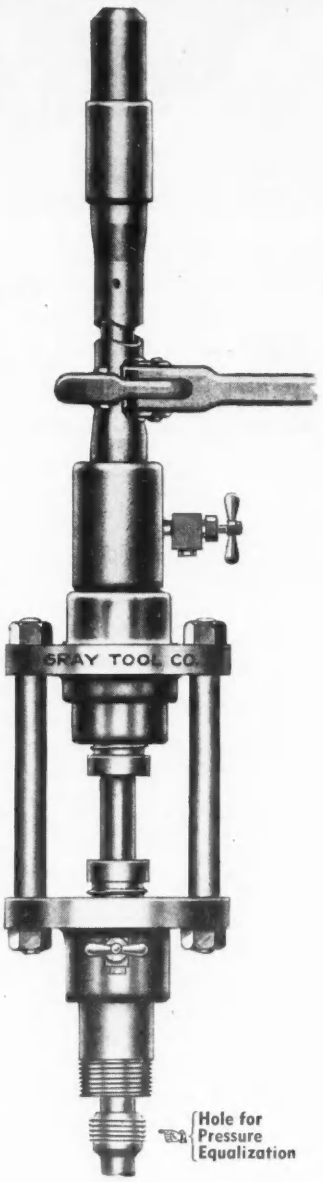
THIS PART CONTRIBUTES TO THE OVERALL ADVANTAGES OF GRAY COMPLETELY COORDINATED SYSTEMS OF WELL CONTROL

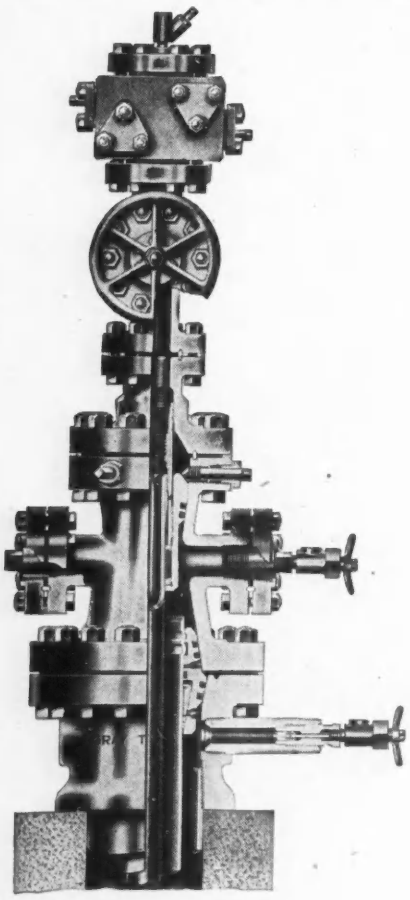
The Gray High Pressure Equalizing Device

The Gray High Pressure Equalizing Device permits the removal of inside blowout preventing back pressure valves from the tubing with convenience and assured safety after the flowing manifold has been completely assembled on the well. It is attached immediately above the flowing manifold. With the control back pressure valve raised into the pressure chamber of the equalizing device, the master valve is closed, permitting its removal for use on many subsequent operations.

This tool is now available under leasing arrangements which provide for exchange, maintenance, and renewal.

This part contributes to the overall advantages of Gray completely coordinated Systems of Well Control.





Complete Well Head Assembly equipped with Composite manifold, Valve Removal, Installation and Removal.

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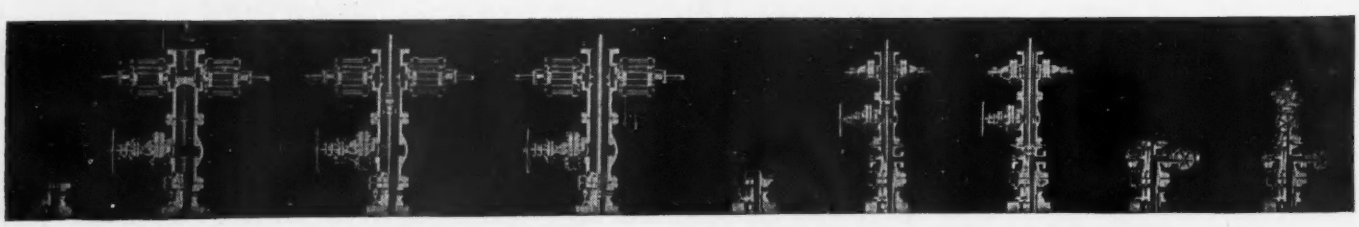
CONTROL DURING AND BETWEEN ALL OPERATIONS WITH GRAY PLANNED PROCEDURE



Casing Head Attached | Drilling | Running Casing | Casing Landed | Drilling Control Equipment Removed | Drilling-in and Running Tubing | Tubing Landed | Control Equipment Removed | Manifold Attached

THE CHANGING Panorama

YOUR Role in Natural Gas Act Amendments

WHATEVER the real reason for the quick dissolution of the "National Oil and Gas Committee" which held its first and only meeting last week in Dallas, it will have served a good purpose if it serves to stir interest among individual oil and gas producers relating to the dangers of further federal encroachment in oil and gas affairs.

Chief among the visible accomplishments of the committee is the letter which it has caused several of its member associations to disseminate. A Paul Revere sort of letter, it might be termed, because of the warning it sounds against a peril which we all know exists, but which we might be inclined, were it not for the alert Paul, to forget for a spell. Then it might be too late.

Deviation from the original intent of the Natural Gas Act is what is causing, to change the metaphor, this creeping paralysis. The Federal Power Commission, for instance, comes along with a ruling by which producing gas properties may be declared a public utility with earnings limited to 6½ percent on depreciated original cost if gas is sold to a natural gas company. Then, as though that isn't enough, the FPC has ruled and it has been affirmed by the courts, that the price at which producers can sell gas can be fixed by the federal government.

Oil and gas associations as well as state regulatory authorities have gone on record against federal control of oil and gas production and utilization, but apparently that isn't enough, because the unhealthy intrusion continues. Consequently an appeal is being made to those individual oil and gas producers opposed to nationalization of these great energy resources for active and aggressive support of an amendment to the Natural Gas Act the language of which has been interpreted in such wierd fashion by the FPC. Dangers lie ahead if changes are not made. A letter to your senator or congressman, or seeing him in person if possible, is definitely in line and strongly recommended. Urge him to vote for amendments that will provide relief from unwarranted assumption of power by a federal agency, power far beyond the intent of Congress at the time the act was originally passed. Suggested are:

1) Deny to FPC any authority to regulate production and gathering, the price at which the producer and gatherer sells gas and for what purpose natural gas may be sold or used.

2) Rigidly limit FPC's jurisdiction to interstate trunk line transportation of gas and to the sale of gas after such transportation is completed for resale for public consumption.

3) Preserve existing state regulatory power over distribution, production and gathering of gas.

Such a statutory pronouncement now might save oil from going through future periods of pain similar to those being experienced by the gas industry.

* * *

Functioning under its greatest freedom from government control since 1941, the American oil industry in 1946 produced a greater volume of crude oil and petroleum products than in any war year, and exceeded the highest prewar peak by more than 24 percent. Barring work stoppages . . . the oil industry in 1947 will substantially exceed the record of 1946.

—J. HOWARD PEW, President
Sun Oil Company.

* * *

There is no room in the engineering profession for unionization. Creative thinking cannot be regimented, and engineers should be more concerned with opportunities than with security.

—A. C. RUBEL, Vice President,
Union Oil Company of California.

* * *

Elsewhere in this issue of THE OIL WEEKLY *is an advertisement, actually a Christmas advertisement by Jones & Laughlin Supply Company. It doesn't attempt to sell the products of the company but deals with some facts of life which all of us should keep in mind. We recommend its reading.*

Petroleum Looms Large in Research

PROGRESSIVE companies usually are never satisfied with today's product or method, but are constantly seeking improvements through research.

"Petroleum Is Progressive;" so it is not surprising that the number of established and proposed research fellowships supported by United States oil companies is a sizeable one.

The American Petroleum Institute recently conducted a questionnaire survey to ascertain the degree to which the petroleum industry supports such a program throughout the country and the findings, while not surprising because *Petroleum IS Progressive,* are nevertheless quite imposing:

Twenty-six companies which responded to the questionnaire now support or plan to establish a total of 211 fellowships in 48 universities and covering 42 subjects. The average annual cost of each fellowship was shown to be $2550, or a total cost of $538,000 yearly. Subjects and the number of fellowships each include: hydrocarbon research, 66; chemistry, 20; chemical engineering, 17; industrial relations, 16; chemistry and physics of petroleum, 11; engineering, 9; geology, 7; civil engineering, international affairs and medicine, 5 each; and petroleum engineering and mechanical engineering, 4 each. A score or more other subjects also are listed for the sponsored fellowships.

Twenty-nine of the students are with the National Bureau of Standards, Penn State has 21, Massachusetts Institute of Technology, 12, California Tech and Ohio State 11 each with the others scattered at institutions of learning located in almost every state in the union.

API explains that the report resulting from the survey cannot be considered complete, but it is believed to include at least 70 percent of the fellowships supported by the petroleum industry.

Work and the Good Earth

The letter reproduced here has aroused widespread interest and commendation. It was first issued in miniature*, following a long-established December custom.

JONES & LAUGHLIN SUPPLY COMPANY

TULSA 2. SERVING THE OIL AND GAS INDUSTRIES OKLAHOMA

J. L. SHAKELY
PRESIDENT

December 10, 1946

To Our Friends and Customers:

Work and the Good Earth - A Great Combination

While in conversation a few months ago with a friend of mine, the talk, as talk will these days, veered around to the difficult problems facing our nation. We talked of the lack of needed food supplies, of building materials, automobiles, steel, copper, lead. We mentioned the seemingly indifferent attitude of many people about working in order to produce, thus assisting our country to continue its growth and hold its well-earned position as foremost among the nations. My friend finally smiled and said, "Don't forget, we have a wonderful team to draw on in the solution of these problems, work and the good earth - a great combination."

Then ensued one of the most inspirational discourses to which one could listen. He pointed out that man lives and survives only as he draws the good things from the good earth by his own labor. How true this is! Practically everything that supports us is taken in some manner from the earth on which we live. In our own industry it is oil and gas produced only after labor has fulfilled its part, and made available to everyone only after labor on the part of many others, each playing a definite position on the team of production and distribution.

Monkey wrenches thrown into the machinery of production can temporarily cause some parts of it to fail, with consequent discomforts to those who are responsible for production, as well as to the ultimate users. In the final analysis we all know that the only way out of these breakdowns is to work honorably and honestly, each according to his ability.

As we draw to the end of this year of great historical moment and look forward to the new year ahead, may I leave this thought that truly Work and the Good Earth are a Great Combination for Peace and Prosperity.

Cordially yours,

President

JLS:heg.

*If you have a miniature copy of this letter with a repetition in the second paragraph, please accept our apology. The unfortunate mistake was made in reproduction of the letter, and not discovered until a number had been distributed.

JONES & LAUGHLIN SUPPLY COMPANY

Subsidiary of Jones & Laughlin Steel Corporation

J&L STEEL

TULSA, OKLAHOMA

THE WEEK'S NEWS

THE State Department shortly will submit a proposed program to the Senate Foreign Relations Committee for action, with the Anglo-American petroleum agreement well up toward the top of the list. Republican sentiment on the pact has not yet crystallized and currently is lukewarm. Story below.

Bacteria and Petroleum—Encouragement is reported in tests of Dr. Claude E. ZoBell's patent to facilitate recovery of oil from the earth by use of bacteria. Page 25.

Big Inch Developments—Congressmen from coal-producing states continue fight to stall disposition of Big Inch pipe lines. Page 28.

Would Sell Canol No. 1—Canada has given permission for the U. S. to junk and sell the $70 million wartime Canol No. 1 project. Page 25.

Middle East Labor—The oil committee of ILO, meeting next month in Los Angeles, will discuss labor conditions in the Middle East, judging from the list of British delegates. Page 26.

Co-Op Tax Review—Congress likely is too badly jammed to get around to a review of tax and other advantages held by cooperative associations. Look for it next year.

Excise on Oil Imports—Russell B. Brown appeared at a reciprocal trade agreement hearing with argument against any lowering of the excise on oil imports. Page 24.

More Casing and Tubing—A survey indicates manufacture during 1947 of 20 percent more casing and tubing than was turned out last year. Story below.

Lobby Law Registrations—Some 300 organization representatives have registered so far under the lobby-registration law enacted last year, but the statute has not resulted in bringing to light any of the undercover "hate" groups at which it was aimed. Oil association representatives are expected to register in the near future, as they become active on legislation.

Rubber Control—President Truman will ask Congress to enact legislation continuing government control over domestic rubber consumption and inventories until a measure can be passed setting out a rubber policy and providing for support of the synthetic rubber industry.

Texas February Allowable—February allowables for Texas were upped 116,842 barrels last week by the Texas Railroad Commission. Page 27.

State Department Is Expected to Ask Early Consideration of Oil Agreement

Little interest in the Anglo-American petroleum agreement has been displayed so far by Republican members of the Senate, and there is no indication that any pressure for ratification will come from within Congress itself.

Asked for their opinion of the agreement, many members covered up their indifference by saying they had yet to study the document, while others said they would wait until the Foreign Relations Committee took the matter up and made its findings known.

The Foreign Relations Commitee itself, however, is more interested in the peace treaties which should come up for consideration this session.

Within a couple of weeks the committee is expected to develop its program, and in the meantime the State Department will submit a schedule of matters it feels should be taken up, in the order of their importance. Because the petroleum agreement has been pending so long, it is expected it will be well up toward the top of the list.

Department officials are anxious that the agreement be taken up and disposed of, and are confident of ratification. They do not like the idea of so important a matter being neglected so long, partly because of the effect of such a situation on negotiations for other similar arrangements. They believe that once the Senate committee can be prodded into action, the agreement can be handled expeditiously, providing a better atmosphere for discussions with foreign governments on other trade matters.

Six of the 13 members of the Senate Foreign Relations Committee are from oil-producing states, but only two of them, Chairman Arthur H. Vandenberg of Michigan and Senator Arthur Capper of Kansas, are on the Republican side. On the minority side, Senators Tom Connally of Texas, Robert F. Wagner of New York, Alben W. Barkley of Kentucky and Carl A. Hatch of New Mexico represent producing states, but of the group only Connally has been consistently interested in oil matters.

The other members of the committee are Senators Wallace H. White, Jr., of Maine, Alexander Wiley of Wisconsin, H. Alexander Smith of New Jersey, Bourke B. Hickenlooper of Iowa and Henry Cabot Lodge, Jr., of Massachusetts, Republicans, and Walter F. George of Georgia and Elbert D. Thomas of Utah, Democrats.

Deviation Drilling Rule

The Texas Railroad Commission's statewide proration hearing last week were advised that the commission would call a special hearing for March 5 in Austin to consider the advisability of a statewide deviation drilling rule.

Other states have adopted rules of this kind. Some thought on the subject was stimulated when Chairman Ernest O. Thompson made some suggestions concerning provisions of such a rule.

20 Percent More Casing, Tubing

A survey of the steel mills manufacturing casing and tubing, conducted by THE OIL WEEKLY indicates that, barring strikes, production of casing and tubing in 1947 will run around 20 percent more than in 1946.

All mills contacted excepting one, expect to be able to produce substantially more such products in 1947 than last year. This is interesting because of the heavy anticipated demand for steel products including pipe for construction and industry generally.

One company said that 1946, in spite of the strike which shut its mills down about one fourth of 1946, had its second best year in history from a production standpoint, and that in one quarter of the year it produced 35 percent of its entire year's output, this because of the excellent production record of the men employed in the mills following the strike.

Heavy backlogs of orders exist on the books of the mills and one executive said that careful checks made by his company indicated no "water in the orders."

It is anticipated that not only domestic use of casing and tubing will increase in 1947 over 1946, but that foreign demand will be substantially greater.

Of course strikes could easily disarrange the anticipated production schedules, but recent report from the steel areas have been more optimistic with reference to industrial peace in the steel industry this year.

THE OIL WEEKLY's check was made by letter and long distance phone, and with the understanding company identifications would not be revealed.

Congressmen From Coal States Keep Fighting to Delay Sale of Big Inch

Congressional delegations from the coal states are speeding up their fight to hold up the sale of the Big Inch pipe lines for anywhere from 90 days to six months after the FPC reports on its natural-gas investigation.

Senator O'Mahoney has introduced a resolution to stay the disposal of the Big Inch pipe lines for 90 days so that Congress may "have an opportunity to study the effect of the disposition of these lines on all the fuel industries."

The issue was raised in the Senate last week for the first time this year when Senator Francis J. Myers of Pennsylvania urged action on his resolution to hold the matter in abeyance until after the FPC reports. Myers declared that use of the lines for natural gas would seriously injure the coal industry and might wipe out the anthracite industry in his state, raising a problem which should have serious study which could not be completed by February 3, when the War Assets Administration recommendation that the lines be sold for any use will become effective if Congress does not act.

Myers received some support from Senator William Langer of North Dakota, who said the government made a profit of $138 million on the wartime use of the lines and therefore now has practically no investment to protect. Langer last year sponsored a bill keeping the lines under government ownership, but in last week's discussion Senator Tom Connally of Texas raised the question of what the government would do with the lines if it held them.

A Senate surplus property subcommittee last week called for the complete overhauling of WAA top personnel, internal organization and policies, and emphasized the necessity for Congress to step in with legislation to protect the synthetic rubber industry, assure maintenance of an adequate network of war-built airports, maintain plants and facilities vital for the national security in stand-by condition, and develop the policy to control the disposal of the Big Inch pipe lines.

Mid-Continent Presidency Goes to F. M. Porter Again

F. M. Porter, Fain-Porter Drilling Company, Oklahoma City, was reelected president of the Mid-Continent Oil & Gas Association for his second consecutive term at the annual meeting in Tulsa. Other officers were elected as follows:

Reelected . . . Jake L. Hamon, Cox & Hamon, Dallas, first vice president; E. F. Bullard, president Stanolind Oil & Gas Company, Tulsa, vice president for Oklahoma; H. E. Zoller, Derby Oil Company, Wichita, Kansas, vice president for Kansas; A. H. Weyland, Arkansas-Louisiana Gas Company, Shreveport, vice president for Louisiana-Arkansas; Van S. Welch, Flynn, Welch & Yates, Artesia, N. M., vice president for New Mexico; Clarel B. Mapes, Tulsa, secretary-treasurer.

New officers . . . Charles E. Simons, Mid-Continent Oil & Gas Association, Dallas, vice president for Texas, succeeding the late George C. Gibbons, and W. M. Vaughey, Vaughey & Vaughey, Jackson, Miss., vice president for Mississippi-Alabama, succeeding C. L. (Buzz) Morgan, Dixie Geological Service, Jackson.

Directors recommended an amendment to the Natural Gas Act so as to expressly deny to the FPC any authority to regulate 1) directly or indirectly the production and gathering of natural gas, 2) the sale (including the price) of natural gas sold by the producer or gatherer, and 3) the end-use of natural gas.

Association directors include James E. Allison, Warren Petroleum Corporation, Tulsa; John Biggs, W. T. Waggoner Estate, Vernon, Texas; Glenn F. Bish, The Ohio Oil Company, Tulsa; E. F. Bullard, Stanolind Oil & Gas Company, Tulsa; Joe E. Butler, Butler-Calhoun Company, Corsicana, Texas; Forrest M. Darrough, The Carter Oil Company, Tulsa; Jake L. Hamon, Cox & Hamon, Dallas; J. E. Holm, The Atlantic Refining Company, Tulsa; Clarel B. Mapes, Mid-Continent Oil & Gas Association, Tulsa; Hayes McCoy, Cities Service Oil Company, Bartlesville, Okla.; J. R. McWilliams, The Carter Oil Company, Tulsa; J. A. Neath, Humble Oil & Refining Company, Houston; E. W. Pollock, Deep Rock Oil Corporation, Tulsa; F. M. Porter, Fain-Porter Drilling Company, Oklahoma City; W. H. Rector, Magnolia Petroleum Company, Little Rock; Alvin Richards, The Pure Oil Company, Tulsa; R. B. Roark, Shell Oil Company, Tulsa; Charles E. Simmons, Mid-Continent Oil & Gas Association, Dallas; A. L. Solliday, Stanolind Oil & Gas Company, Tulsa; John M. Starke, Jr., Southern Production Company, Shreveport; J. W. Timmons, Sun Oil Company, Dallas; A. F. Truex, Sun Oil Company, Tulsa; W. M. Vaughey, Vaughey & Vaughey, Jackson.

Tidelands Decision Delay

Contending that the states upon entering the Union acquired no rights other than those expressly granted by the federal government, the Department of Justice on January 17 asked the Supreme Court to decree the ownership of the federal government to the three-mile belt of the California coast involved in the tidelands case, and to enjoin further "trespassing" by the state or persons claiming under it.

The Attorney General asserted that the original states did not own the tidelands at the time of the formation of the Union and did not then make any claim to title. When the three-mile belt subsequently became a reality under the sponsorship of the national government such property rights as derived therefrom emerged as the rights of the federal government, he said.

The Supreme Court is expected to reach the case during the week of February 3, but in view of the short time which the state now has in which to answer the government's brief it is expected it will ask for an extension of 30 days.

Argues for Restoration of Quota Basis on Oil Imports

Further reductions in the excise taxes on imported oil products would leave the United States at the mercy of the importing companies and in the event of another war might find the country without sufficient petroleum available for military activities, a panel of the Committee for Reciprocity Information was warned January 17 by Russel B. Brown, general counsel of the Independent Petroleum Association of America.

At hearings on the proposed reciprocal trade agreement with 18 nations, Brown presented the picture of the independent operator, whose interests, as well as those of national defense, oil industry labor and the consumer, he said, demanded not only that no further cuts in tax be made but that the original rates be restored and crude imports be put back on a quota basis.

Brown asked that he be permitted to see all briefs filed with the committee on the subject of oil with a view to challenging any inaccuracies of fact, and urged the committee to remove the seal of secrecy. Chairman John P. Gregg agreed to take the matter under consideration.

Brown predicted that within a few years foreign production will be at a point where large volumes of oil will be available for import into the American market unless the domestic industry is given protection. He pointed out that in enacting the Reciprocal Trade Agreement Act, Congress specified that oil, coal and certain other products protected by excise taxes on imports should not be affected. That restriction, he charged, was violated in the Venezuelan agreement but former Secretary of State Hull sold Congress on the idea by assuring that the quota system then adopted would protect the industry adequately. The quota system was abandoned in the Mexican Agreement of 1943, he said, and since the close of the war, imports have been steadily increasing.

Republican leadership in Congress last week began exploring the possibilities of legislation to trim the President's tariff-making powers. Meeting with Assistant Secretary of State William L. Clayton, Senate President Arthur H. Vandenberg of Michigan and Finance Committee Chairman Eugene D. Milligin of Colorado warned that Congress would take action if plans to reduce the protection on some 800 commodities are carried out.

Strake Sells Interest In Conroe Field Leases

George Strake, Houston oil operator, has sold his working interest in six leases he holds in the Conroe field to Nassau Associates, Inc., of New York and it is reported that the properties will be operated by the McAlester Production Corporation, subsidiary of McAlester Fuel Company, McAlester, Oklahoma. The sale included all of the properties that Strake had remaining in the Conroe pool. The consideration was not announced.

Statistics Job, Flare Gas Problem Expected to Be Discussed by NPC

A number of problems described by OGD Director Max W. Ball as "important and pressing," will come up before the National Petroleum Council at its meeting in the Interior Department tomorrow.

Heading the list are expected to be the question whether the council will cooperate in compiling statistics on reserves, with special emphasis on availability, maximum efficient rate and other factors affecting crude supply. Pre-meeting discussions indicated that there are two views on the question, one that it is not a subject for government action and the other that the compilation of statistics is a pre-requisite to any government-industry planning for future policies and operations.

Another subject in which there is considerable interest is the keeping of up-to-date information on refinery types and capacities, suggested by the Army with a view to having a maximum of information regarding military supply possibilites in the event of another emergency.

Also on the list of probable subjects is the question of flared gas, brought out late last year by Texas Railroad Commissioner Ernest O. Thompson before the House Surplus Property Committee during investigation of the disposal of the Big Inch lines.

Because of the time required to get the organization machinery started, Secretary J. A. Krug recently extended terms of present members of the council from June 30 to December 31, next, and tomorrow's meeting is expected to include election of a permanent chairman and vice chairman. Nominations for those posts and other officers will be submitted by a committee headed by R. G. A. Van der Woude, president of Shell Union Oil Corporation. There was some speculation that Walter S. Hallanan, elected temporary chairman at the initial meeting last June, might be drafted for the post.

Final plans for the meeting will be laid today by the agenda committee, which will be the first to make use of the council's new Washington offices in the Stoneleigh Court building.

Ralph K. Davies, former head of the OGD, is expected to attend the council meeting as a consultant, but he is not a member of the council.

Piecemeal Sale of Canol Project Is Agreed Upon

Secretary of State Byrnes last week reported that Canada has agreed to let the United States junk and sell piecemeal the $70 million war-time project known as Canol No. 1. Thus may be sold all or any part of the pipe line from Norman Wells, Northwest Territory, to Whitehorse, Yukon Territory, the refinery at Whitehorse and related facilities to Canadian or other buyers, either for export or use in Canada, duty and excise tax-free.

The report said investigation has disclosed "no known economical postwar utilization."

The United States' related finished products distribution systems in Canada, known as Canol Nos. 2, 3 and 4, have not been declared surplus and are not covered in the agreement.

The Office of Foreign Liquidation Commissioner will offer Canol No. 1 by parcels or lots or combinations with sealed bids opened on March 20.

Any or all of the facilites not sold may be removed by the U. S., and Canada may buy any facilities which it desires. Facilities not sold or removed two years after the effective date of the agreement, January 29, may be left in place and "regarded as of no value unless utilized." Canada has agreed that the U. S. shall be entitled to fair compensation if such facilities subsequently are utilized.

Asks Conservation Study

A recommendation that a state engineering committee on conservation of Texas' natural resources be created was made last week by the San Jacinto Chapter of the Texas Society of Professional Engineers. Similar committees would be established in the principal population centers of the state. The recommendation was passed on to the society's state meeting.

William J. Murray, Jr., recently appointed to the Texas Railroad Commission spoke on natural gas conservation.

Hearings Scheduled

Evidence concerning Sun Oil Company's proposed installation of three pressure-maintenance plants in the Yturria, East, and Guerra fields of Starr and Jim Hogg counties, will be presented at Texas Railroad Commission hearings January 21.

Evidence of progress made toward elimination of gas flares in the Old Ocean field of Brazoria County since the last hearing held October 15, 1946, will be presented to the Texas Railroad Commission at a hearing February 7.

Tests of ZoBell Patent for Release of Oil by Use of Bacteria Are Encouraging

Apparent ability of bacteria to release oil from ground-up samples of Bradford oil sand in the Pennsylvania Grade Crude Oil Association's laboratory has given encouragement in the search for a way to adapt a patented discovery of Dr. Claude E. ZoBell of La Jolla, Calif., to field conditions.

While testing various kinds of bacteria for their ability to modify crude oils, ZoBell, who is an associate professor of microbiology at the University of California's Scripps Institution of Oceanography, observed in March, 1943, that certain cultures released droplets of oil from test tubes filled with calcareous material prepared to simulate underground oil-producing formations. Further experiments showed that the bacteria were able to release oil from samples of Athabaska tar sands and Santa Maria oily shales.

These observations were reported to the Advisory Committee on Occurrence and Recovery of Petroleum of the American Petroleum Institute, which felt that the discovery was of sufficient importance to warrant protecting it for the benefit of the industry as a whole, whereupon ZoBell assigned the patent to the API for the free use of the public. (It is a basic principle of the University of California and the Institute's fundamental research program that all information resulting from its sponsored research projects shall be made available to the public without charge.)

The Penn Grade Association, also a non-profit organization, has been cooperating in the investigations during the last two years in attempting to apply the discovery to the recovery of oil under field conditions. While there are still technical difficulties to be overcome, the results so far are sufficiently encouraging to warrant continuation of field experiments.

The research project, 43A, on the origin of oil, of which ZoBell is director, is concerned primarily with the part played by bacteria in transforming organic matter into petroleum. Investigations indicate that under certain conditions bacteria may produce oil, modify petroleum or its products, or release oil from sedimentary materials.

Laboratory experiments indicate that bacteria can release oil from oil-bearing sediments by dissolving calcareous materials, by crowding the oil off physically, and by producing surface-active substances. Carbon dioxide produced by the bacteria and the increased porosity caused by dissolving calcareous materials both favor the flow of oil. The ability of bacteria to grow in and to penetrate oil-bearing sediments has been demonstrated.

Dr. Jay V. Beck, Penn Grade's bacteriologist, was assigned to make laboratory tests of the possibilities of applying the bacteria to the field. Dr. Richard V. Hughes is in charge of the Association's entire production research program with ZoBell a consultant in the bacteria investigation.

Penn Grade's findings are also assigned to the public benefit.

Copies of the ZoBell patent (No. 2,413,278) can be obtained from the U. S. Patent Office, Washington, D. C., at a cost of 25 cents each.

(Editor's Note—Dr. ZoBell's article "Functions of Bacteria in the Formation and Accumulation of Petroleum" appeared in THE OIL WEEKLY February 18, 1946, starting on page 30.)

Exploratory and Experimental Work In Progress at Elk Hills Reserve

An extensive exploratory program is being launched in the Elk Hills field, California, by the Navy Department and Standard Oil Company of California, coowners of the unit operation.

The purpose of this program, started just before war's end, is to determine the oil reserves and productivity of untested areas in Reserve No. 1. Four heavy drilling rigs currently are exploring the Stevens zone between 5000 and 8000 feet and one light rig is being used in the shallow zones between 3000 and 4000 feet.

Thirty shallow tests and 8 Stevens zone tests have been drilled and it is estimated that these wells have resulted in locating 50 million barrels of recoverable oil in the shallow zone and 180 million barrels in the Stevens zone. Less than half of the $7.5 million appropriation has been expended.

Most of the exploratory drilling has been west of the county road, which runs north and south through the center of the Reserve. Shallow zone measures appear quite spotty in this area, but the Stevens zone has great possibilities. A very good Stevens zone well was obtained in Sect. 24-30/22, in the extreme westerly section in the Reserve.

Production in the Stevens zone has been found in both sand and fractured cherty shale. Establishment of the fact that light oil production can be derived from fractured shales opens up new possibilities on other structures in the state.

Exploration will continue until sufficient information has been obtained on the various productive measures to permit a reasonable estimate of their oil reserves and their rate of availability. After the wells are completed and tested they are shut in and maintained in "a state of readiness."

Extensive Experiments

Right after V-J day production from Elk Hills was cut from 65,000 to 15,000 barrels daily. It has been further reduced since and current production is 8450 barrels per day which represents that quantity necessary for the proper maintenance of the field and that required to carry out certain experimental projects.

These projects are being carried on to test the effects of natural water drive, pressure restoration by gas injection, and gravity drainage.

Gas from the shallow gas zone is being used to repressure the shallow (Scalez) oil zone, more than three billion cubic feet of gas having been used for this purpose. Helium is being used as a tracer.

A remedial program of repair and exclusion of water also is being carried out. The major part of this work is in the "Old Area." As the results of the various production projects become apparent and the water is excluded from the wells producing water, it is planned to further reduce the production rate of the field in order to conserve as much oil in the ground as possible.

Independent Organization Buys Union Oil Drilling Facilities

R. A. Powell

J. D. Robinson

The Santa Fe Drilling Company, a new organization with an authorized capital stock of $500,000 has purchased the drilling facilities of Union Oil Company of California.

Stockholders of the firm, which will go into operation February 1 as an independent drilling contractor, are about 65 former Union employes.

Officers are J. D. Robinson, president, and R. A. Powell, secretary-treasurer, with H. P. Wickersham, Frank Gess, Howard Robinson, Lee Goss and Kent Garner completing the board of directors. J. D. Robinson was formerly general drilling superintendent for Union; Powell was an accountant; Wickersham was chief mechanical engineer; Gess was district drilling foreman, Coast Division; Howard Robinson was district drilling foreman, Southern Division; and Goss was district drilling foreman, Valley Division. Garner was an experienced driller.

The company will start out with complete facilities, and in addition to drilling and well repair work, will provide oil field mechanical engineering service and service on mud control. Headquarters are at Santa Fe Springs, Calif.

Continental Sells Drilling Facilities to New Company

Continental Oil Company has disposed of its drilling facilities in California and will contract all of its wells in that state in the future.

Purchaser is the newly-formed drilling contracting firm of Bell and Burden, composed of A. H. (Ham) Bell, formerly general superintendent for Continental in California, and Dewey Burden, head of the Owl Truck and Construction Company. It is understood that the new firm will take over Continental's drilling personnel. The company has been operating four strings of wells in California.

ILO Group May Discuss Middle East Conditions

Anticipating that the International Labor Organization oil committee meeting at Los Angeles next month may devote special attention to the condition of labor in the Middle East, the British delegation to the sessions will include officials of companies operating in that area.

The government delegates will be J. A. Diack, assistant secretary in the Ministry of Labor and National Service, and K. L. Stock of the Ministry of Fuel and Power, with E. E. Jones, petroleum attache in the Washington Embassy, as their adviser. The two industry delegates are E. R. C. Beard, acting head of the industrial relations department of Shell Oil Company, and R. B. Sauthall, general manager of National Oil and Refining Company, Ltd., whose advisers will include R. B. Kerr of Trinidad Leaseholds, Ltd., Sir Harold Wolper of Burma Oil Company, Brigadier S. H. Longrigg of Iraq Petroleum Company, and Mr. MacNeill of Anglo-Iranian Oil Company.

A spokesman for the British Embassy said the meeting is considered of considerable importance because it is the first session of the petroleum committee, on which twelve countries will be represented, and its deliberations might form the groundwork for elevation of the condition of native workers in areas in which British and American companies operate. It is not expected, however, that any action will be required with respect to the workers in the United States.

National Oil and Gas Group Resolves, Disbands

The recently organized National Oil and Gas Committee met in Dallas last week, adopted the report of its legal sub-committe regarding amendments to the Natural Gas Act and then was dissolved.

The only statement regarding the dissolution was contained in a press release which said "the National Oil and Gas Committee having completed the function for which is was created was dissolved."

The legal sub-committee's report recommends, among other things, that the Natural Gas Act be so amended as to make it clear and definite that the Natural Gas Act will not apply to the producers and gatherers of natural gas or to the sale of natural gas by them to interstate pipe lines.

The report further recommends that the Federal Power Commission be given no jurisdiction or authority to determine or control the use for which natural gas may be sold.

The recommendation would limit the jurisdiction of federal regulation under the Natural Gas Act primarily to interstate trunk line transportation of gas and to the sale of gas for resale for public consumption, as was originally intended by the Congress in the act of 1938.

(See Panorama discussion, page 21.)

Further Research in Sedimentology And Tectonics Suggested to AAPG

By ANTHONY GIBBON
Staff Writer

The need for further research in sedimentology and tectonics was stressed by the research committee of the American Association of Petroleum Geologists at the Mid-Continent regional meeting last week in Wichita, Kans. Approximately 1000 members attended.

Dr. Shepard W. Lowman, Shell Oil Company, and Dr. Marcus A. Hanna, Gulf Oil Corporation, Houston, chairman and vice-chairman, respectively, of the AAPG research committee, announced they would recommend to the executive committee that members undertake fundamental research work in sedimentology, the work to be conducted in an integrated manner so as to include physical, chemical and biological investigations. Research would cover the fields of environments of deposition and post-depositional change, in clays and carbonates and associated materials such as formation water, organic constitutents of the sediments, etc.

A more complete study of salt dome structures based on available data from salt works and sulphur mines as well as a survey of the known knowledge of faulting, together with a recommendation that laboratory work in tectonics be more widely undertaken, was recommended by Dr. Philip B. King, U. S. Geological Survey, Washington, D. C. King also recommended an intensive study of faulting as it is presently occurring in the alluvial basin of the Mississippi River. This, he said, would enable geologists to study faulting processes now in motion and enable better interpretation of faulting which has already taken place in the older strata.

Recommendation for laboratory experimental work in tectonics is to reproduce on a small scale the broad phases of tectonics as they occur in nature so as to show faults and foldings and to furnish valuable clues in locating favorable petroliferous areas.

Robert R. Wheeler, Eason Oil Company, Enid, Okla., discussed oil possibilities in the Anadarko Basin which has attracted considerable attention during the past few years and indicated oil will be found in the Simpson sands and the Viola and Hunton limestones as well as in the structurally and stratigraphically trapped early Pennsylvanian sands.

V. J. Mercier, Lane-Wells Company, Wichita, described the principles and operation of well logging by radioactive means with special emphasis on the use of such logs in limestone reservoirs.

G. H. Westby, president, Seismograph Service Corporation, T[illegible]a, pointed out that so far only th[illegible]agnetic, the gravitational and the seismic methods have obtained results of recognized geologic value. He added that the refraction seismic method is being and will be utilized in certain areas of the Anadarko Basin and the Texas Panhandle as well as in areas of Southern Kansas in which reflection work is unsatisfactory and in order to reveal large structures. The northern Mid-Continent area will continue to be explored by normal application of the other three methods.

Many other technical papers were given.

Chairmen of the Wichita committees included E. C. Moncrief, Edward A. Koester, John L. Garlough, M. J. Boreing and K. T. Woodman. E. Gail Carpenter, president of the Kansas Geological Society, gave the address of welcome.

Rangely Ratio

The Colorado Gas Conservation Committee has called a meeting for January 20 to consider setting of a gas-oil ratio for the Rangely pool. Action was prompted by information that there has been considerable waste of gas in the area.

Crude Oil Production in the United States

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED Jan. 18	Jan. 11
Alabama	600	1,150
Arkansas	73,000	73,500
California	880,500	887,400
Colorado	36,200	37,800
Florida	240	240
Illinois	194,600	194,700
Indiana	17,300	17,500
Kansas	257,050	189,900
Kentucky	29,600	29,800
Louisiana	408,375	408,125
North Louisiana	94,750	94,500
South Louisiana	313,625	313,625
Michigan	42,700	42,000
Mississippi	86,050	89,500
Missouri	100	100
Montana	22,600	21,600
Nebraska	700	500
New Mexico	103,500	103,500
New York	13,600	13,750
Ohio	7,800	7,900
Oklahoma	363,650	355,800
Pennsylvania	35,900	36,250
Tennessee	35	35
Texas	1,931,615	1,931,615
Tex. R. R. Comm. Districts:		
Dist. 1—S. Central	19,085	19,085
Dist. 2—Lower Gulf Coast	133,110	133,110
Dist. 3—Upper Gulf Coast	412,175	412,175
Dist. 4—South West	206,525	206,525
Dist. 5—East Central	33,700	33,700
Dist. 6—East Texas Field	301,000	301,000
Dist. 6—Rest of North East	99,435	99,435
Dist. 7-B—West Central	34,000	34,000
Dist. 7-C—West	27,585	27,585
Dist. 8—West	464,725	464,725
Dist. 9—North Central	118,225	118,225
Dist. 10—Panhandle	82,050	82,050
West Virginia	7,400	7,600
Wyoming	101,200	100,000
Total United States	4,614,315	4,550,265

Total stocks, foreign and domestic, January 11, as reported by the Bureau of Mines were 220,553,000 barrels.

Texas Allowable Upped For Month of February

A February proration order fixing a net allowable of 2,190,348 barrels to be produced in Texas was issued last week by the Railroad Commission. This represents an increase of 116,842 barrels over the January 11 allowable.

A general statewide schedule of 22 producing days was retained for February and the East Texas field was left on 20 producing days with the Panhandle exempt. Allowables for all districts were increased with the exception of West Texas where producing days were reduced from 18 to 16.

The commission estimated that operators will produce 6.75 percent less oil than is allowed which will mean an actual production of 2,042,500 barrels. To this will be added 184,741 barrels of distillate and natural gasoline, bringing the state total of 2,227,241 barrels of all oils. The new figure is 197,241 barrels higher than the February demand of 2,030,000 barrels for Texas oils as estimated by the Bureau of Mines.

Refiners and purchasers strongly urged increased February allowables at the statewide hearing. Nominations for February totaled 2,426,735 barrels, up 3775 barrels over January nominations. A commission tabulation for the past six months indicated that nominations consistently exceeded production by approximately 15 percent, and that actual demand, as calculated by the commission, was less than allowables.

In reply to a query from J. Sayles Leach, vice president of The Texas Company, the commission estimated that 2,674,946 barrels of oil could be produced daily in Texas if West Texas were given its outlet capacity of 520,000 barrels and the rest of the State raised to the MER. Leach said that available above-ground crude in Texas declined 12 million barrels from September 1, 1945, to January 4, 1947. He said that imports are increasing.

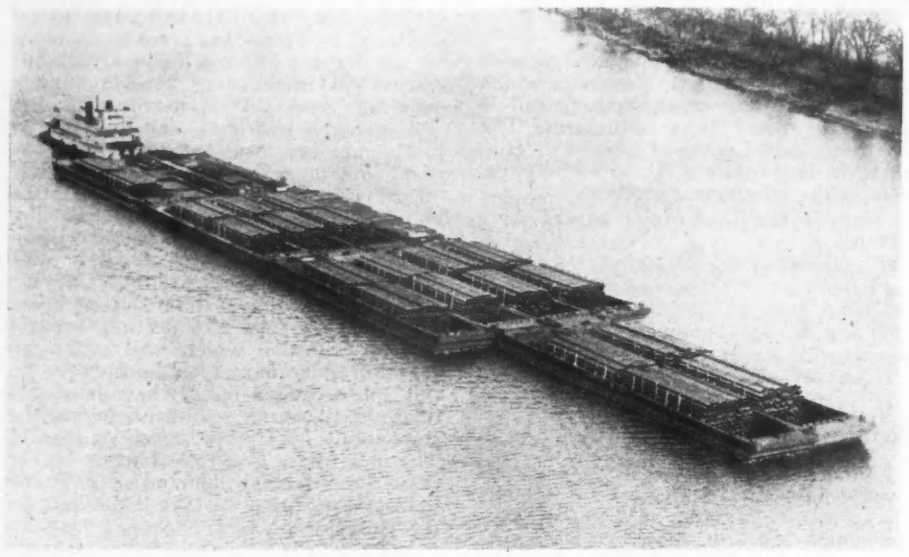
Commissioner-designate, William Murray, Jr., of Houston, was present and Governor-elect Beauford H. Jester made his last appearance as a member of the commission.

The next statewide hearing will be held February 18 in the Rice Hotel in Houston.

Houston Nomads Elect

Houston Chapter Nomads will install its 1947 officers, elected last week, at an inaugural dinner dance January 24 at the Rice Hotel. The slate includes: President, Charles E. Richards, Gray Tool Company; Vice President, George E. (Red) Tyson, Jones & Laughlin Supply Company; secretary-treasurer, C. L. Clausel, A-1 Bit & Tool Company; assistant secretary-treasurer, Herschel J. Wood, Lebanon Steel Foundry; sergeant-at-arms, Jack Barnes, Trinity Portland Cement Company; deputy sergeant-at-arms, Edwin Ross, Baash-Ross Tool Company; regents, Charles W. Thornhill (retiring president), Thornhill-Craver Company, and Floyd L. Senter, National Tank Company.

Pipe for Gas Lines of Texas



Steel pipe destined for Tennessee Gas and Transmission Company's new gas transmission line now under construction in southwest Texas is shown above as it moves down the Ohio river. This is a portion of one of the largest steel pipe shipments—a total of 11,100 tons—to be transported via inland waterways since the beginning of World War II.

This tow of the Neville, a Union Barge Line tug, contains 11 barges of steel pipe, part of the 11,100 ton order, one barge of steel and one barge of cement. The entire shipment will utilize 34 barges of steel pipe that are being moved via the Ohio and Mississippi rivers into the intracoastal canal to Corpus Christi, Texas.

The Tennessee Gas and Transmission Company is using the pipe, all 16-inch diameter, to build a 95 mile extension to its natural gas line from Nueces County, Texas, to the San Salvador field in the Rio Grande Valley. Associated Contractors and Engineers, Houston, are building the line for TGT.

Storage Facilities Asked By Michigan Consolidated

The FPC has received an application from Michigan Consolidated Gas Company for authorization to construct gas storage facilities in the Austin and Reed City gas fields of Michigan. Included is approximately 43,000 feet of field lines in the Austin field and 49,000 feet in the Reed City field. The two fields will be used to store gas delivered through the proposed Michigan-Wisconsin Pipe Line Company system from the Texas Panhandle. The Michigan-Wisconsin Pipe Line Company is a subsidiary of Michigan Consolidated Gas Company.

The company reported that additional facilities in the Austin storage field were substantially completed before the FPC authorized construction of the Texas-Michigan line, and that the first Reed City facilities will be completed this year and the second group before the end of 1951.

In another application, Penn-York Natural Gas Corporation asked authority to build a 65-mile pipe line with diameter ranging from 14 to 10¾ inches from York, N. Y., to the Niagara River near Lewiston, with a 1200-horsepower compressor, at an estimated cost of $1,235,610, to export 15 million cubic feet of gas daily to Dominion Natural Gas Company, Ltd., of Ontario.

Colorado - Wyoming Gas Company also has filed with the FPC for construction of an eight and ten-inch line from Denver, to Cheyenne, Wyo., with a 1200-horsepower compressor, at a cost of $1,415,000, to increase the capacity of its system from 23 to 35 million cubic feet daily.

Sinclair Progresses With Network for Oil Products

Construction on Sinclair Refining Company's network of products pipe lines in Ohio and part of Michigan is progressing with deliveries being made into the new terminal at Detroit.

The new Detroit terminal is at the end of a 56-mile 6-inch line running from Toledo. At Toledo the line connects with Sinclair's existing products line of more than 1,260,000 gallons daily capacity that runs from the Sinclair refinery at East Chicago. Capacity of the new Detroit line is 50,000 gallons daily and will be increased, as needed, up to 800,000 gallons daily.

From Toledo Sinclair is building another line to Columbus through Marion, Ohio—118 miles of 6-inch line and two pump stations.

At Marion another branch line to this system is being built to Cleveland, Akron and Youngstown, joining Sinclair's present Marcus Hook-Steubenville products line from the Atlantic Coast at the latter point. The Marion to Youngstown line involves the laying of 225 miles of 6-inch pipe.

Sid Richardson Takes Over Southport Lines and Plant

Sid W. Richardson, Fort Worth independent producer, has purchased the Southport Petroleum Company's 20,000-barrel daily capacity refinery at Texas City, Texas, from Clint W. Murchison and associates for a reported consideration of more than $2 million. The refinery, which will concentrate on domestic and foreign refined oil markets reached by barge and tanker deliveries, will have Freeman W. Burford as manger.

Richardson, a large independent producer of oil in West Texas and the Texas-Louisiana and Mississippi Gulf Coast region, will have a substantial portion of this controlled oil available for the plant, or for exchange for more accessible crudes, while existing crude purchase contracts held by Southport also will be available. The refinery has direct pipe line connection to near by coastal fields, and several major trunk lines are connected to the plant's tank farm.

A 13,000-barrel daily capacity Houdry aviation gasoline cracking unit built by the government for Southport to operate during the war is scheduled to be sold by WAA in February.

Stanolind to Build Gasoline Plant in Elk Basin Field

Permission has been granted Stanolind Oil & Gas Company, Unit Operator for the Elk Basin field, Wyoming, by the Civilian Production Administration for preliminary construction of buildings to house a $4½ million gasoline plant and repressure system. Construction is expected to be completed within two years. The plant would process 12 million cubic feet of gas per day and the repressure system is expected to handle 14 million cubic feet of inert gas per day.

Stanolind engineers are progressing with plans for a large hydrocol plant designed to process about 100 million cubic feet of gas per day yielding approximately 6000 barrels per day of high-quality gasoline and 1000 barrels of distillate fuels. Tentative plans are for the plant to be located in southwestern Kansas in the Hugoton field.

The plant is being designed to process low-heating-value gas currently unsuited for sale as fuel gas. An extensive pipe line gathering system and a natural gasoline plant would be installed.

RMOGA Committees

Chairmen of seven standing committees of the Rocky Mountain Oil & Gas Association were named at the recent quarterly meeting of the association's directors at Casper, Wyoming.

The chairmen include, J. F. Cullen, production; Frank Gower, public lands; A. Baker, taxation; J. M. McIntire, natural gas; Harry C. Chapman, legal and legislative; Fred M. Manning, Jr., finance and budget, and H. P. Macauley, public relations.

The next quarterly meeting of the directors will be held in Billings, Mont., April 10-11.

Tax Changes Continue for Oil Firms in Venezuela

The Venezuelan Constituent Assembly, which officially assumed its powers on December 17, has technically kept the word given by the revolutionary Junta that no extraordinary excess profits tax, such as that levied at the end of 1945, would be levied, but has enacted the expected permanent surtax which will have approximately the same effect.

While not specifically an oil tax, its effect will be felt by all of the principal producers, since oil companies pay approximately 50 percent of taxes collected in Venezuela. Under the permanent surtax act, companies making as much as $8.4 million will fall in the top bracket of 28 percent, this in addition to the normal 2½ percent tax. Its total effect will be imposition of a somewhat lower tax than the extraordinary excess profits tax of 1945, and reductions to as much as 4 percent may be allowed for portions of profits turned back into capital investment within the country. It has been made retroactive for 1946.

Meanwhile, Dr. Juan Perez Alfonzo, Venezuelan Minister of Development, recently said he thought the government should receive 50 percent of the profits from oil operations instead of the present 16⅔ percent.

The government's take from oil operations by foreign companies will be increasingly invested in projects which will permanently aid and diversify the national economy, he said.

The government has been considering the 50-50 split for some time in a general way, the minister declared.

Turner Valley Crude Oil Price Advance Is Posted

The crude oil price in Turner Valley, Alberta, Canada, was advanced 50 cents per barrel January 15 following scrapping of subsidies by the Dominion Government on American oil imports into the Prairie Provinces.

The new price is $2.65 per barrel on the basis of 42-gravity crude. The price hike affects about 18,000 barrels daily production and will also affect values of heavier crude in other Alberta fields.

Research Organization

A petroleum research and development organization, to be known as Esso Development Company, has been formed by Ango-American Oil Company for the purpose of working "in close collaboration" with officials and private organizations.

Esso Development, registered in England, also will coordinate its work with that of the existing research organizations of Standard Oil Company (New Jersey).

Directors of Esso Development include: D. A. Shepard, chairman of Anglo-American; R. A. Carder, managing director of Anglo-American; Brian Mead, refining coordinator for European companies of the Standard group, and R. C. Tett, managing director of the new company.

Russian Perforator

The invention, by a Soviet engineer, of a new type of casing perforator is reported in the Soviet press, according to the *Foreign Commerce Weekly*.

The apparatus is described as consisting of a steel gun which is lowered into the drill hole to the level of the oil-bearing strata. It is equipped with two 37-mm. torpedo-type projectiles. When the projectile is shot it is said to perforate the wall of the casing and penetrate the oil-bearing strata a distance of 1½ meters (about 59 inches) before it explodes.

Trinidad Leaseholds Cuts Back From High War Rate

Trinidad Leaseholds, during the 12-month period ended June 30, 1946, drilled a total of 152,617 feet in Trinidad and compares with 160,094 feet drilled in the same period in 1944-45.

During the year, 6,419,800 barrels of crude were produced from the company's own fields, a decrease of 762,100 barrels, or about 11 percent for the year. This reduction was the result of the output of the Forest Reserve field being curtailed to a more economic level than the high wartime rate.

The company has purchased from the British government the aviation fuel refinery and its associated facilities which the firm erected and operated during the war.

Brazil's November Output Continues to Show Decline

Crude oil production in Brazil during November, 1946, totaled 8445 barrels, bringing the country's 11-months production to 61,454 barrels. This compares with 79,000 barrels produced during 1945 and indicates that Brazil's oil output for 1946 will be about 14 percent under the previous year.

During November, the Candeias field's eight wells produced 8123 barrels while two wells in the Aratu field produced 322 barrels. The Itaparica and Pitanga fields were shutin.

Liquid Bitumen Reserve Found

A liquid bitumen reserve, estimated at 400 to 500 million barrels, has been uncovered by the Dominion Government on the west side of the Mildred-Ruth Lakes area, 20 miles north of Fort McMurray in Northern Alberta, Canada.

Discovered in the course of its wartime exploration operations in the bituminous sand area of Northern Alberta, the deposit will be turned over to the Abasand Company, under the agreement whereby the government took over wartime operation of this company in an effort to speed commercial development of the "tar sands."

USSR Plans Extensive Exploration in Moldavia

Extensive exploration of possible oil-bearing areas in Moldavia, located in the extreme southwest portion of the Soviet Republic on the frontier of Roumania, will be undertaken as part of the current USSR Five-Year Plan, the Russian Embassy in Washington has disclosed. A large but unspecified fund has been allocated for the work.

A report on 1946 developments stated that the oil industry in the eastern regions of Russia fulfilled its year's production program ahead of schedule. Output increased by 80 percent compared with the last prewar year and 26 percent compared with 1945, it was said. The increase was due to the extended working of the Devonian sands in Tuimazy and the Stavropol area in the Volga Valley, the so-called Second Baku, as well as the development of new deposits in Uzbekistan.

Japanese Oil Production Reported Falling Behind

A strike of Imperial Oil Company employes in September cut Japanese oil production for that month by approximately 25 percent, the War Department has been advised.

Production, which had reached a peak of 20,943 kiloliters (131,522 barrels) in August, dropped to 15,691 kiloliters (98,539 barrels) in September. Output for the first half of the current fiscal year is considerably below scheduled volume, amounting to 112,767 kiloliters (708,175 barrels). A production of 250,000 kiloliters (1,570,000 barrels) was planned for the year.

The petroleum exploitation program also is two or three months behind schedule, and because producer subsidies were not included in the amended national budget following a crude price increase of more than 150 percent, Imperial Oil has been forced to borrow large sums.

Work In New Guinea

Contract has been awarded to F. H. McGraw and Company, engineers and constructors of Hartford, Conn., by the N. V. Nederlandsche Nieuw Guinee Petroleum Maatschappij for the construction of two piers and approximately 100 kilometers (about 62 miles) of roads in the dense jungle country of Western New Guinea.

The roads will give access to new drilling sites in this territory. A number of wells had been in production at the beginning of World War II, but all installations were destroyed either by the Dutch, or by the Japanese during their occupation.

Dodge Appointed

Harris T. Dodge has been appointed assistant to the vice president in charge of The Texas Company's foreign operations department. Orin B. Small succeeds Dodge as general sales manager of the firm's foreign sales department.

Controlled DIRECTIONAL of Wells

Part 1

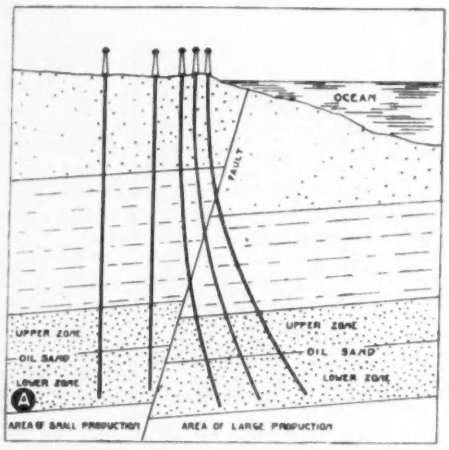


Figure 1. Wells beneath the ocean.

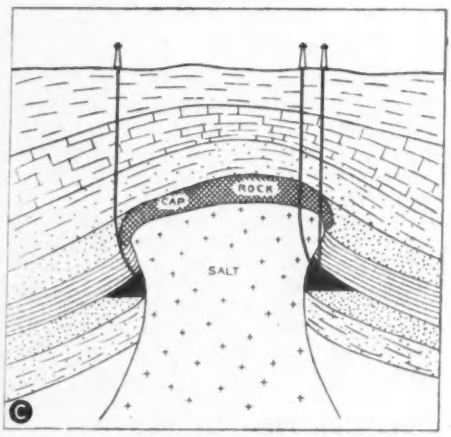


Figure 2. Wells under piercement-type salt domes.

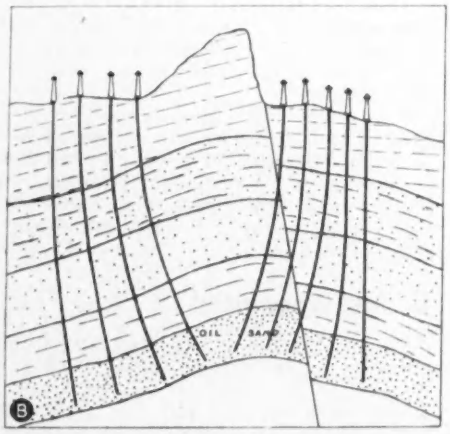


Figure 3. Wells beneath a hill.

ONE of the phenomenal advances made in the drilling art during the last 15 years is controlled directional drilling of wells and controlled vertical drilling of wells, both of which have developed from relatively crude methods to an art based on scientific principles.

Controlled directional drilling is the technique followed in drilling a well to some predetermined point below the earth's surface which is horizontally distant from the surface location.

Controlled vertical drilling is the method followed for drilling wells as nearly straight or vertical and within a specified maximum inclination off the vertical (usually ranging from one to two degrees).

Numerous developments in petroleum engineering and technology have been responsible for these two advances in the drilling art. Among these are improved types of inclinometers, directional well surveying instruments, deflecting tools, instruments and equipment for orienting deflecting tools, improved and specialized types of drilling bits, weight indicators, and specialized mud fluids.

It is the purpose of this paper to mention the various applications of controlled directional drilling, to point out the principal factors for successful controlled directional drilling, to explain the geometric principles underlying the method of controlled directional drilling, to briefly describe the equipment and the technique used, and to review some of the accomplishments.

Applications

Controlled directional drilling is employed in two general applications:

A. For drilling new wells which cannot be located directly above the desired completion point.

B. For redrilling wells where a correction in the natural course of the well is desirable or necessary.

Under the first application come wells located beneath the ocean, lakes or river bottoms (Figure 1), wells located under the piercement type salt dome overhangs (Figure 2), wells located around objectionable locations, where the surface topography makes drilling at an angle from a lower location preferable to deeper drilling through a hill (Figure 3), relief wells for bringing under control burning or blown-out wells (Figure 4), wells drilled on a physically restricted area such as an island or pier from which a plurality of holes are drilled from one location (Figure 5), wells drilled at an angle into the formation so as to give greater penetration (Figure 6), mutiple wells drilled from one location for the purpose of subsurface geological exploration.

Under the second application come wells redrilled for the purpose of correcting excessive drift and direction, to straighten the well, to prevent trespass, to sidetrack lost tools, to direct the course toward the productive side of a fault, to direct a well back into a hole which caved in and was lost, and to direct the course of the hole away from edgewater into the productive zone.

It has become common practice for many companies to include in their drilling program these many possible applications of directional controlled drilling.

Principal Factors for Successful Controlled Directional Drilling

There are two principal factors essential for successful controlled directional drilling:

A. The use of oil well surveying instruments and the correct interpolation of the information obtained from their use.

There are in general use various types of well surveying instruments, descriptions of which have been given in papers presented at meetings of learned societies or in oil production trade journals.[1]

The two types of directional surveying instruments necessary for accurate directional controlled drilling are:

1. The multishot directional surveying instrument for determining the actual course of the bore hole. Surveys made with this instrument are called informative surveys. They enable the driller to select the most advantageous point in the hole from which to commence controlled directional drilling operations and to properly plan the new course of the hole. They are always made prior to starting directional drilling operations and frequently repeated upon the completion of the hole.

2. The single-shot directional surveying instrument which is used at regular depth intervals during controlled directional drilling operations for the purpose of checking the corrective measures which have been used. These surveys are called operative surveys.

B. An accurate method of orientation of the deflecting tool underground.

Correct orientation of the deflecting tool is the basis for successful controlled directional drilling. Without it, it is impossible to reach the objective speedily and with certainty. Three methods of orientation are in general use:

1. Drill stem orientation.

This method, invented and patented by Alexander Anderson (U. S. Patent No. 1,770,224), was mostly used during the early period of controlled drilling.

Presented at the National Conference on Petroleum Mechanical Engineering A. S. M. E. Petroleum Committee, Tulsa, October 7-9, 1946.

Drilling

By G. L. KOTHNY
Vice President, Sperry-Sun
Well Surveying Company

An easily visible target about 700 feet away from the derrick is selected and the base line from the center of the well to this target is established. Two adjustable drill pipe clamps, provided with mountings for a transit, are used. One clamp is placed immediately above the deflecting tool and the transit is aligned with the azimuth of the deflecting tool. The angle between the deflecting tool's azimuth and the base line is measured. The other clamp is placed on the upper end of the stand of drill pipe and the transit sighted on the target.

The first clamp is removed, the drill pipe is lowered, and the next stand of pipe is added. The transit which formerly was in the upper end of the standard drill pipe is now located immediately above the rotary table. This transit is now turned onto the target and the turn in the drill pipe is read in degrees and minutes and recorded. The transit and the clamp are removed. The other clamp is fastened to the top of the second stand of drill pipe and the transit in this clamp is reset and sighted on the target. The process is repeated until the deflecting tool reaches the bottom of the hole.

The algebraic sum of these records indicates the position of the deflecting tool in relation to the starting azimuth. from this position the angle necessary to bring the tool into the desired orienting position is determined.

This method of orientation is accurate in vertical holes or in holes inclining in one vertical plane. In holes which spiral or frequently change their direction (dog-leg) torque and tortuosity, which cannot be measured, may greatly affect the accurate reading of the direction.

This method also requires a large amount of field work and is therefore slow; its accuracy relies upon the adjustment of the transit and the accuracy of its graduations. Any errors made in reading or recording the amount or the direction of rotation of the pipe are cumulative; sighting is impossible during foggy or rainy weather and there is always the possibility of sighting upon the wrong distant target, particularly when such orientation is made at night.

2. Indirect method of orientation.

This method, invented and patented by A. G. H. Straatman (U. S. Patent No. 1,806,509), requires the knowledge of the direction and inclination of the hole at the point at which deflection is intended. This information is usually obtained from a preliminary multishot survey of the hole. Any suitable inclinometer may be used. Its principle is based upon establishing the angle between the azimuth of the deflecting tool and the azimuth of inclination of the hole. This is accomplished by various means, for instance by providing a landing seat for the inclinometer which has a groove indicating the azimuth of the deflecting tool and by providing the inclinometer with a lead bottom. In setting the inclinometer on the landing seat, an impression will be left on the lead bottom from which the angle between the azimuth of the deflecting tool and that of the inclination can be determined.

Since the direction of the inclination is known from the preliminary multishot survey, the actual position of the deflecting tool at the bottom of the hole can easily be determined from the record.

3. Direct method of orientation.

This method, invented and patented by Robert Hyer (U. S. Patent No. 2,120,670), uses a non-magnetic sub (Figure 7), made of forged K-monel metal about 14 to 16 feet long, which sub contains two small magnets and provisions for seating a directional single shot instrument in which the inclination unit has been temporarily replaced by a second compass unit.

The relative azimuth position between the direction of the deflecting tool and the north attracting magnet in the magnetic sub is determined from the drilling assembly above the rotary prior to lowering it into the well. This is done by attaching a protractor with its zero point to the scribe line on the deflecting tool, which indicates the azimuth in which the deflecting tool is facing, and by clamping a telescope to the non-magnetic sub arranged above the deflecting tool and aligning it with the scribe line, indicating the azimuth of the north magnet in the magnetic sub (Figure 8). With these instruments in place, the angle betwen the azimuth of the face of the deflecting tool and the azimuth of the north magnet in the magnetic sub is read directly. The drilling assembly is then lowered into the hole and when the deflecting tool reaches the bottom and prior to setting it, a single-shot record is made. This single-shot record (Figure 9) shows two compass records. On its outer circumference there is a circular compass scale indicating the magnetic north. Inside of the circular compass scale it shows a compass needle. The section of the needle with the round black circle, which has been attracted by the magnets arranged in the non-magnetic sub, indicates the azimuth of the north magnet in the non-magnetic sub. The actual position of the deflecting tool underground is determined through a direct reading of the angle between the two compass records and by adding or subtracting the angle between the azimuth of the face of the deflecting tool and the azimuth of the

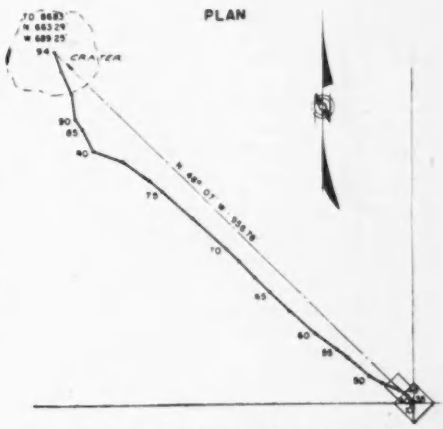


Figure 4. Relief well for blown-out well.
Courtesy *Oil and Gas Journal*

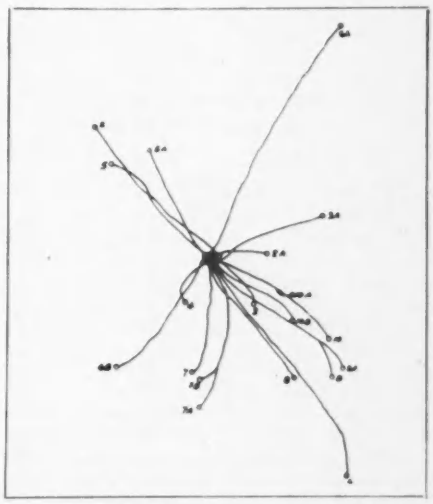


Figure 5. Wells drilled from a restricted area.
Courtesy *Oil and Gas Journal*

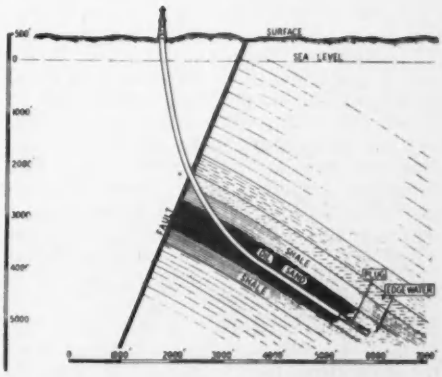


Figure 6. Wells drilled at an angle to give greater penetration.
Courtesy *Petroleum World*

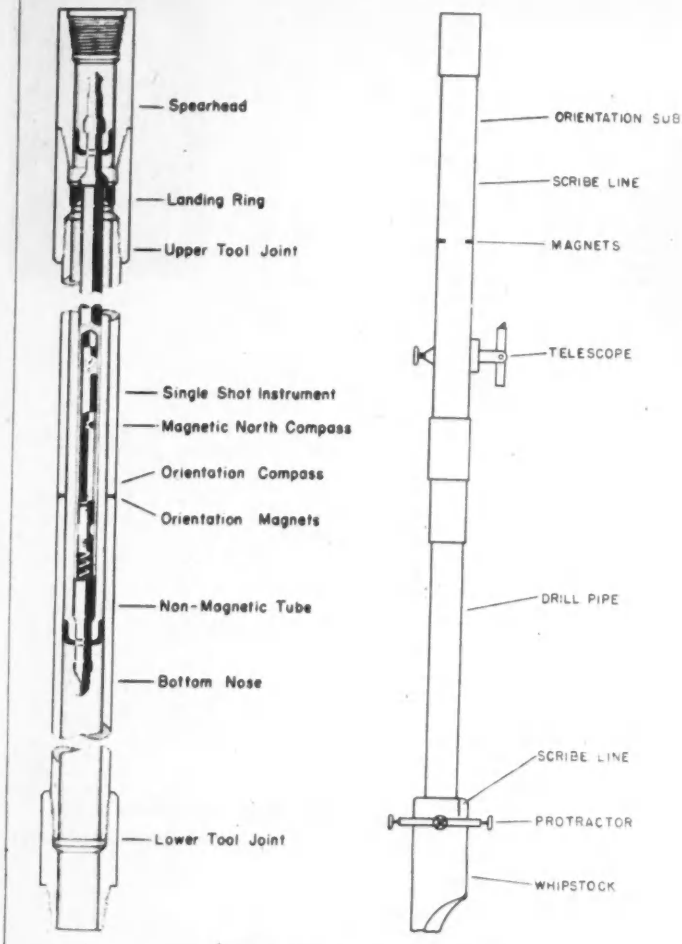


Figure 7 (left). Non-magnetic orientation sub.
Figure 8 (right). Determination of angle between face of deflecting tool and orientation sub.

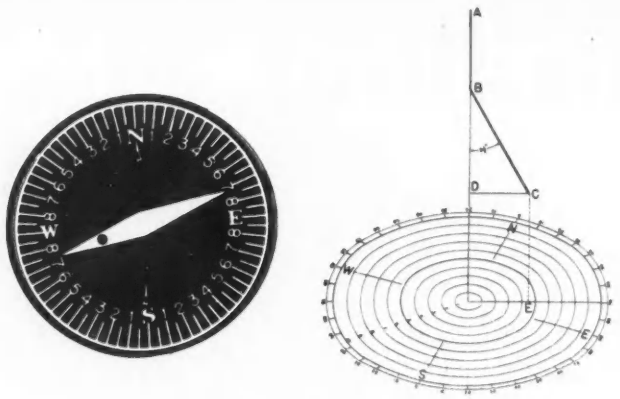


Figure 9 (left). Orientation single-shot record.
Figure 10 (right). Diagram of deflecting of a straight hole in one plane.

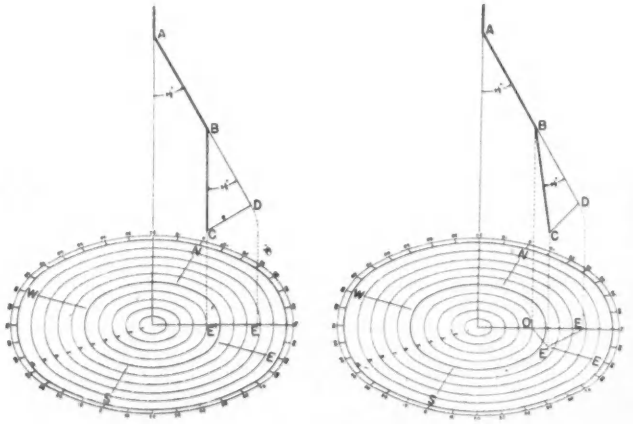


Figure 11 (left). Diagram of straightening of a hole in one plane.
Figure 12 (right). Diagram of deflecting an inclined hole into another vertical plane.

north magnet in the non-magnetic sub previously obtained.

Knowing the actual position of the deflecting tool at the bottom of the hole, the angle necessary to turn it into the desired position is easily determined. The drill pipe is then spudded to relieve it of any torsional stress and then rotated to bring the tool in the desired position. After this has been done, another single-shot record is taken to obtain a photographic record of the final position of the deflecting tool before setting it and proceeding with the drilling.

Another direct method of orientation is that invented by Bremner and Potter, (U. S. Patent No. 2,207,505). It uses a non-magnetic sub which in its lower part has an inwardly faced projection in the form of a vertically elongated key. The orienting member carries a directional single-shot instrument in a fixed position. The single shot has means to show the relative position or orientation of the record with respect to the slot in the orienting member. The orienting member at its lower end is provided with a spiralled cam, which, through its engagement with the elongated key, will cause the orienting member to rotate into a definite position in the sub.

The angle between the azimuth of the slot in the sub and that of the face of the deflecting tool is measured prior to lowering the drilling assembly into the hole. When bottom is reached, a single-shot record is made and from this record the actual position of the deflecting tool underground can be read.

The direct method of orientation is speedy and accurate. A photographic record of the actual position of the deflecting tool is always obtained before proceeding with the drilling operation, giving assurance of starting in the desired direction. It can be performed by one man. It is safe, as it does not require men to work on top of the derrick. All operations are done on the derrick floor. It can be executed during foggy and rainy weather, at day or night, and also with a high degree of accuracy in straight holes.

Principles of Geometry Applied to Determine the Setting of Deflecting Tools

These are described in a clear and easily understandable manner in a paper by Douglas Ragland,[2] from which the following extracts are quoted:

"When a deflection tool is set in a vertical hole, the resulting deflection quite logically will be produced in the same direction as the deflection tool setting. A deflection tool set in a hole not vertical, however, may or may not produce a deflection in the same direction as the deflection tool setting, and the determination of this latter result is by no means a simple problem in solid geometry. These various types of settings can best be discussed with the aid of illustrations.

"In Figure 10, the line AB represents a section of vertical hole and our problem is to produce a 3½-inch deflection in a N-70°-E direction. The triangle BCD represents a deflection tool, BC is the deflected hole, and DC points to the direction in which the deflection tool is set. Below the deflection tool is a compass card drawn in a horizontal plane and inscribed with circles representing deflection angles plotted to a linear scale (say 1-inch=2°). The cross, E, is a projection of C on the compass card, and the complete card, when interpreted like a single shot disc, reads 3½°, N-70°-E, which was the desired result. Figure 10 illustrates the statement that a deflection tool set in a vertical hole will produce a deflection in the same direction as the deflection tool setting.

"Another truth is apparent from examination of Figure 10. If a deflection tool is set in a hole not vertical, but is faced with the vertical plane including the hole, the resulting deflection will be in the same plane as the deflection tool setting. The tool can be set to build up drift, in which case the deflection will result in the direction of the original hole, or the tool can be set to decrease drift angle so that the deflection will be in the opposite direction of the original hole. This latter setting is illustrated in Figure 11 where the line AB represents a section of the hole slanted at 3½°, BCD the deflection tool set to decrease drift angle, BC the deflected hole, and BD a continuation of AB had the hole not been deflected. Since this deflection began at a point away from the vertical

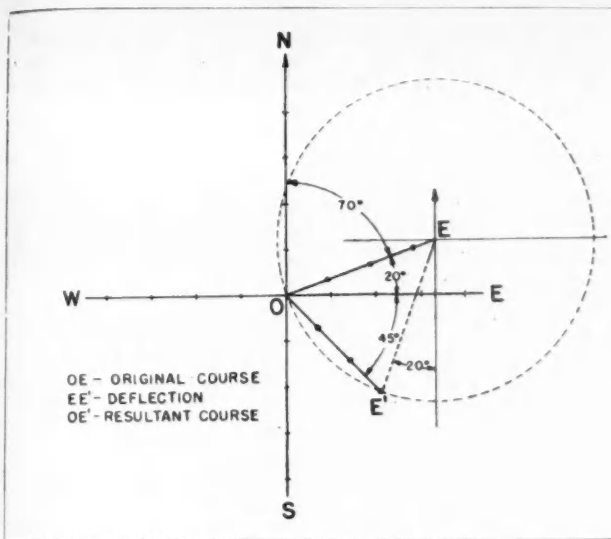


Figure 13. Vector diagram.

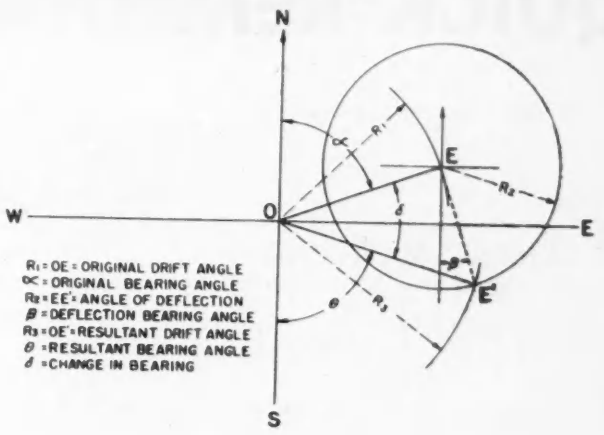


Figure 14. Vector diagram.

axis of our large compass card, an auxiliary axis is superimposed with its center at E′ and the line EE′ represents the line DC revolved and projected on a horizontal plane to show the size and direction of the deflection on the single shot scale. Here the 3½° deflection was made in a S-70°-W direction, or exactly opposite the direction of the original hole, and resulted in a zero drift angle. Queerly, this operation is often referred to as "straightening" the hole, when in reality the hole is only made vertical at the expense of a 3½° crook, or dogleg.

"One condition is common to the two types of deflection illustrated in Figures 10 and 11: In each case the original hole, the deflection tool, and the deflected hole are all contained in a single, vertical plane. When this relation does not exist, we have a third type of deflection, illustrated in Figure 12, where the original hole and the deflected hole are in separate vertical planes, and the deflection tool itself lies in a third plane, not vertical. Referring to the figure, we again start out with a 3½°, N-70°-E hole, AB, and it is desired to produce a deflection that will result in a hole of say, 3°, S-45°-E. As before, BCD represents the deflection tool, and BD a continuation of AB had the hole not been deflected. Now the original hole, AB, is in a vertical plane having a bearing of N-70°-E, but the deflected hole, BC, is not and can not be in that same plane (since the deflection tool was set away from that plane) but lies in a second vertical plane which has a bearing of S-45°-E. Examination of the deflection tool discloses a third plane, BCD, which is not vertical, and does not face in the direction of the deflected hole; when CD is revolved and projected to the horizontal, the deflection tool setting is seen to be about S-20°-W. In other words, although the deflection tool was oriented S-20°-W, the resultant deflection is S-45°-E.

"The solution of a problem of this sort appears quite complicated, and would become an involved calculation if attacked by geometry alone, but luckily at least for the field man, a far simpler method is available. Bearing in mind the horizontal projection OE, OE′, and EE′ of BD, BC, and CD in Figure 12, refer to Figure 13, which is the identical problem shown as a horizontal projection only. This projection is known as a vector diagram and is constructed by drawing directions in their true relation on a compass axis, and drawing drift angles to a linear scale so that the length of each line represents some particular drift angle. In the figure, OE is our original 3½° N-70°-E hole, EE′ is the deflection tool set S-20°-W, and CE′ is the deflected hole bearing S-45°-E at about the point E. Now, since in the drawing is a circle having a radius equal to EE′, the deflection tool angle, drawn about the point E. Now, since in the problem illustrated we have that the resultant deflected hole, OE′, is the vector resultant of the original hole, OE, and the deflection tool, EE′, it follows that the point E′ could be located at any point on the dotted circle and we would have available a variety of deflection tool settings with corresponding resultant deflections.

"The vector diagram applied to just such a general problem is shown in Figure 14, and with the aid of the following instructions, the solution of any deflection tool setting may be had:

1. Lay a quadrant, N-S-E-W, with center, O.
2. With a protractor, lay off an angle, $\propto$, representing the bearing, or direction angle of the hole to be deflected.
3. Describe an arc about the center, O, so that the radius R_1, of the arc represents the deflection angle of the original hole drawn to a linear scale, i.e., $1'' = 2°$.
4. Draw a line, OE, at the angle $\propto$ so that the length of OE is equal to R_1. Then OE is a vector representing the direction and deflection angles of the original hole.
5. Draw an auxiliary axis through the point E. about E describe a circle having a radius, R_2 where R_2 is equal to the deflection tool angle to the same scale used for R_1.
6. Then draw a line, OE′, where E′ is any point on the circle, R_2, and OE′ will be the resultant deflected hole having a bearing, θ, and a deflection angle represented by R_3.
7. The line EE′ represents the deflection tool setting necessary to produce OE′ from OE, and the angle, β, is the bearing of the deflection tool or the direction in which the deflection tool is oriented to face.

"Several interesting facts are brought out by this diagram. The angle δ represents the change in bearing, or angle of turn, between the original and the resultant holes. It is seen that for maximum turn, or change in direction, with a given size of deflection tool, the line OE′ must be drawn tangent to the circle R_2. For producing turn without changing the deflection angle, OE′, must be drawn so as to intersect the circle R_2 at one of the intersections of the radius R_1. To increase or decrease drift angle without producing turn, the line OE′ must be parallel to OE and we have our original problem one and two."

Correct setting of a deflection tool to reach a desired point can also be based on exact mathematical principles. The mathematical solution of this problem, however, is complicated and directional drillers prefer to use the simpler vector method, which can be easily executed by means of a set of scales arranged in a convenient manner.

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[*To Be Concluded Next Week*]

QUICK REMEDIAL WORK SOLVES Difficult Blowout

By GILBERT M. WILSON
Staff Writer

QUICK thinking and unusually efficient coordination of men and materials were instrumental recently in successfully controlling a 65 million cubic foot flow of wet gas, mud, sand and water, which geysered from a producing well that had suffered a failure in surface pipe connections.

The well, R. E. Havenstrite's Barnes 7, located in the Newhall field about 35 miles northwest of Los Angeles, was completed in March, 1946, flowing 175 barrels of 41-gravity oil with a gas flow of 1500 mcf per day. Some months later it was noticed that considerable pressure was developing in the annular space between the 11¾-inch surface string and the seven-inch oil string. In a short while pressure had built up to a point where it caused the surface equipment to fail, this failure stemming from a leak that had developed in the weld securing the base unit to the surface string. In a short time the side of the base unit was cut out, this being followed shortly afterward by the cutting out of the Christmas tree and suspension parts supporting the seven-inch casing at the surface. With loss of control of the well almost certain, the remaining portions of the Christmas tree and all surface fittings were stripped down to the base plate by the crew.

With the well then flowing uncontrolled, but clear of surface obstructions, it was decided to construct a special packer in the form of an inverted liner hanger having inside and outside diameters that would enable it to be lowered down over the seven-inch casing, the latter string still being at the top of the well and inside the 11¾-inch surface string. Such a seal, it was believed, would effectively shut off the flow through the annulus. An 8⅝-inch nipple ten feet long, with liner hanger on the lower end, and a nine-inch, 6000-pound test gate valve on the upper end was to be made up. Two 3-inch horizontal valves were to be positioned a short distance below the nine-inch gate to provide communication to the well after the large gate had been closed. It was believed that this assembly would position the packer about 12 feet below the base plate, a point believed below the ruptured portion of the surface string. These plans were laid out one day and that night the fittings were made up by an oil well tool manufacturing company. Meantime, a 60-foot boom crane was brought out and moved into position for lowering the assembly over the well. The crane was necessary inasmuch as there was no derrick on the well.

Inverted Liner Hanger Installed

The following morning the inverted liner and packer assembly was brought to the well for installation. In stabbing the packing assembly into the well, four guy lines were attached to the lower end of the packer in order to stabilize it while it was being lowered over the slip stream. Two snubbing lines were fastened to the upper end of the unit, these being passed downward through snatch blocks attached to steel eyes grouted in the cellar, then up to the crane winch.

The packer assembly was lowered into place without incident, the only difficulty being in passing the packer down over the seven-inch casing, as the latter was about three feet below the base plate. A 11¾-inch guide sleeve was employed to facilitate stabbing the packer assembly into the well. Placed around the 8⅝-inch nipple, this sleeve was intended to support the valve assembly above the base unit. After the packer had been positioned at the proper depth, the hold-down slips were released and the entire assembly then elevated slightly to expand the packing in the 11¾-inch string. The nine-inch gate valve atop the 8⅝-inch nipple then was closed.

The well continued to blow, however, the flow coming from around the base, and it was discovered that the 11¾-inch casing apparently had been cut out to a point even below the packer seal. To shut off the flow it would be necessary to remove the packer assembly and add more nipple length to set the packer lower in the well.

To afford a better chance of sealing in the 11¾-inch casing, it was decided to increase the length of the packing cell in the new packer to ten feet, and at the same time substitute rubber for lead as the packing medium. While the second packer was being made up, the first was left in the well to protect the 11¾-inch pipe as long as possible from the effects of abrasion by the flow.

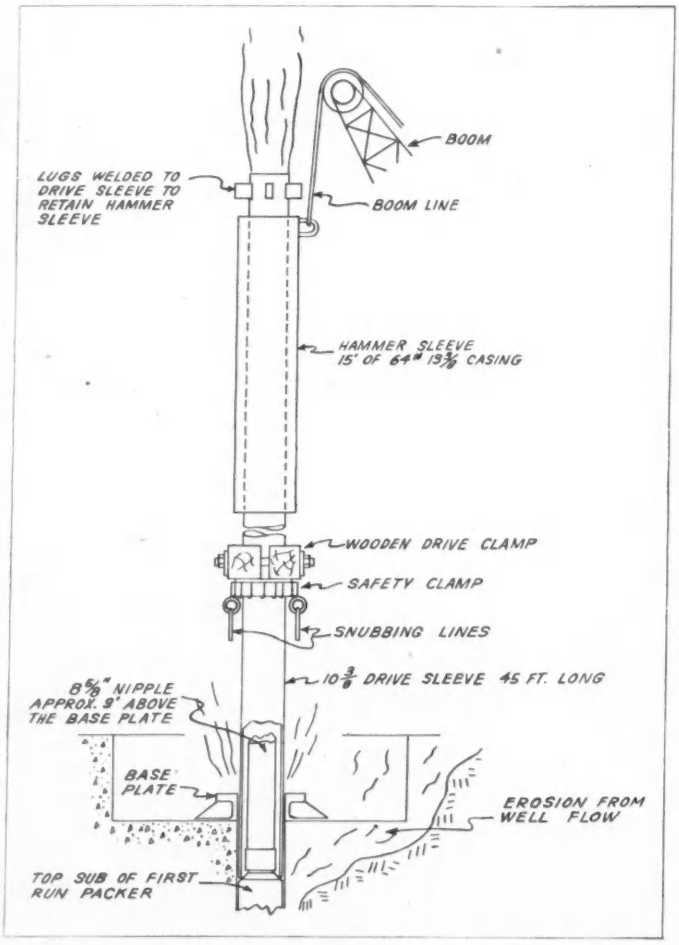

BOOM
LUGS WELDED TO DRIVE SLEEVE TO RETAIN HAMMER SLEEVE
BOOM LINE
HAMMER SLEEVE 15' OF 64# 19⅜ CASING
WOODEN DRIVE CLAMP
SAFETY CLAMP
SNUBBING LINES
10⅜ DRIVE SLEEVE 45 FT. LONG
8⅝" NIPPLE APPROX. 9' ABOVE THE BASE PLATE
BASE PLATE
EROSION FROM WELL FLOW
TOP SUB OF FIRST RUN PACKER

Figure 1. Arrangement of fittings installed over well for purpose of driving first packer down in the well so second packer could be run in to greater depth. The 960-pound hammer sleeve telescoped over the drive sleeve was used in pile-driver fashion, to move first-run packer farther down in hole. No derrick was above well at this stage of operations.

Packer Assembly Jammed

Further trouble developed when the time came for removing the first run unit preparatory to running the second. It was discovered that the releasing mechanism had been sand cut and eroded to such a degree that the slips would not release. Every means was resorted to in attempting to release the slips and remove the packer, but without success. Within a short while the wild flow of gas had eroded and weakened the upper end of the 8⅝-inch nipple, and the valve assem-

Problem

bly, which included the nine-inch gate and three-inch horizontal valves, was blown off. Thanks to the fact that the valve assembly had been left attached to the boom line, the unit was not thrown too great a distance into the air, and fortunately did not fall on any of the workmen who were around the well at the time. The short 11¾-inch guide sleeve which had been around the 8⅝-inch nipple was hurled more than 300 feet into the air, disappearing over an adjacent hill.

Close inspection of the well revealed that the original packer had not been moved by the explosion and that most of the flow now was confined to the 8⅝-inch nipple, approximately three feet of which still remained above the base plate. In view of the inability to release and raise the first packer, the only alternative was to try to move it farther down in the hole to permit placing the second one above it. This driving operation was accomplished by rigging up a 45-foot long driving sleeve of 10⅜-inch special pipe, having inside and outside diameters such that it could be passed down the annulus between the 11¾-inch casing and the 8⅝-inch nipple. This sleeve would come to rest on the sub immediately above the first packer, where it would be in position for driving the first-run unit down the well.

Drive Sleeve Installed

A safety clamp and hardwood driving clamp were fastened to the driving sleeve so that they would be located just above the base plate when the sleeve had been positioned at the desired depth. A 15-foot length of 13⅜-inch, 64-pound casing then was telescoped over the upper end of the driving sleeve, and projections or lugs welded to the upper end of the latter. An eye was welded to the upper end of the hammer sleeve, the boom line being connected at this point. Figure 1 diagrammatically illustrates the arrangement of fittings as they were assembled at this point in the operations. The assembly as shown was hoisted in the air and lowered into the well in the same manner as was the first packer unit. While the snubbing lines were kept taut, holding the drive sleeve down tightly against the packer sub, the hammer sleeve was alternately raised and dropped, hammering against the wooden drive clamp in pile-driver fashion, causing the packer to be driven down into the well to a point below where the second packer was to be set.

After original packer had been driven to the proper depth, the second packer assembly was made ready to be lowered into the well, the drive sleeve being left in the well temporarily in order to protect the 11¾-inch casing as much as possible. When all was ready, the drive sleeve was removed, and the 30-foot spacer nipple, with the ten-foot packer cell on its lower end and the nine-inch valve and side arm valves on the upper end, was lowered over the well for stabbing into the casing. Again trouble developed, it being found this time that the slip stream was so violent as to cause the displacement of the rubber packer rings, thus making it impossible to stab the packer into the well.

Fully realizing that with the drive sleeve removed, the 11¾-inch string would in a short time be cut out down to the newly positioned first-run packer, the crews set about finding a quick means of securing the packing rings so the second unit could be lowered into the well. It was decided to lay the packer down and wrap the entire ten-foot length of the cell with common black friction tape. This was done, the tape being wound spirally to encase both the packing rubbers and the metal spacing rings.

The unit again was picked up by the crane and lowered into the well, this time without incident. After it had been positioned at the proper depth, the unit was rotated to release the slips, elevated slightly to cause the rubbers to expand and seal off in the 11¾-inch casing, and the surface valves then closed. Much to the relief of engineers and workmen who had been struggling with the problem, the well finally was shut in. Figure 2 illustrates the final shutin assembly.

Survey Instruments Run

A short time after the well had been shut in, a temperature survey was run to 2042 feet, a bridge preventing access to the well below that point. The survey showed that gas was coming from below that point. A thief sample was run in and found no mud in the hole down to that depth, indicating the seven-inch had been abraded at or below that point. Pressures at the surface ranged from 1100 to 1600 pounds per square inch, depending upon the amount and quality of mud that was being pumped into the well at intervals.

Following these surveys, a concrete mat was prepared about the well and derrick and drilling equipment moved in. A double-acting control gate was mounted atop the nine-inch gate valve; a ten-foot riser of nine-inch pipe with a control head on top of it was screwed into the well, and a hydraulically-operated control head then assembled at the top. Great quantities of heavy mud then were pumped into the well to lower casing head pressure, after which a 6⅝-inch impression block was run. The block could not be lowered below 60 feet and the impression obtained was of the 8⅝-inch coupling which was part of the first packer assembly. This indicated also that the seven-inch had dropped down in the hole, the tubing apparently having dropped with it also. Heavy mud again was pumped into the well, causing pressure to drop to approximately 800 pounds per square inch.

Circulation was established to 2000 feet by running in a string of 1¼-inch tubing, a variety of materials being used in an effort to reduce pressures still further. Wood shavings, chicken feathers and fiber materials, along with heavy mud mixtures, were circulated. This finally brought the pressure down to zero, where it remained for six to eight hours. However, pressure soon built up to 500 to 600 pounds per square inch, and heavy mud mixtures again were circulated. A socket was run and recovered one joint of 2½-inch tubing, the top of which was at 60 feet. At the present time, the well, shown in Figure 3, is standing with 290 pounds per square inch pressure on the casing. Work has been temporarily suspended pending further decisions as to what will be done.

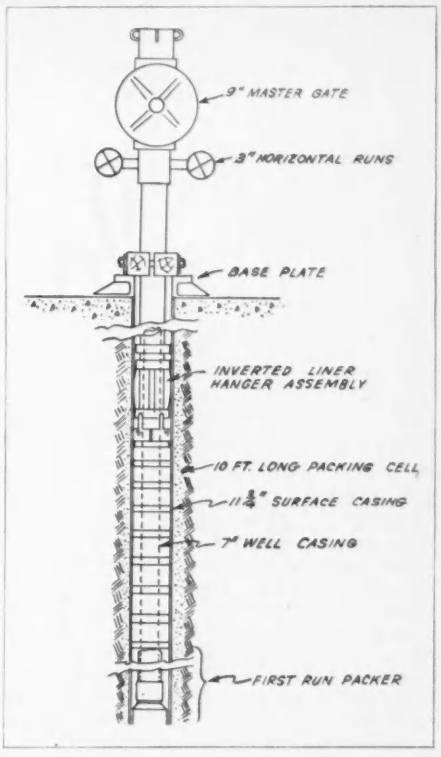


Figure 2. Relative positions of second-run packer and other fittings when well finally was brought under control. Note first-run packer below 10-foot long cell of second unit.

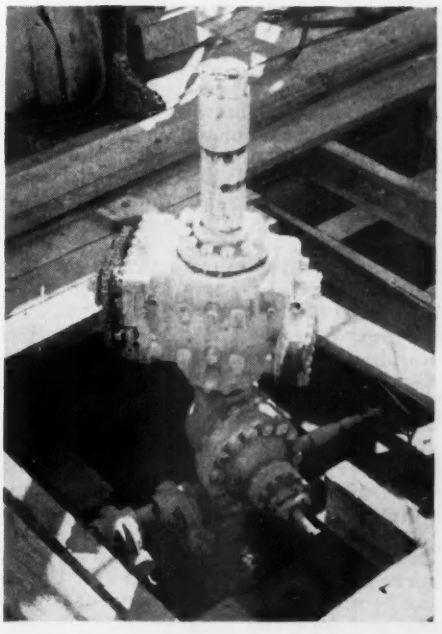


Figure 3. Well as it now stands with approximately 290 pounds pressure on the inner string. Rig and drilling equipment were moved in after well had been brought under control. At the time circulation was obtained with 2000 feet of 1¼-inch macaroni, two additional control heads were mounted atop the above-pictured double-acting control head.

EXPANDING FRONTIERS OF NATURAL GAS

In West Virginia

By DAVID B. REGER
Consulting Geologist, Morgantown, West Virginia

NATURAL gas development of West Virginia is expanding rapidly, both in lateral and vertical directions.

Oil and gas were first discovered in the shallow salt well borings of the Great Kanawha Valley near Charleston shortly after January 15, 1808, when the first of these holes was successfully completed at a depth of 58 feet. There is no authentic record of the actual date or depth of the first oil discovery, but considerable quantities were reported in the first few years after 1808; and in 1815 a very considerable gas well was drilled by Capt. James Wilson on the C. C. Lewis property in what is now Charleston.

No log of this well is afforded, nor is there knowledge that it was ever used. In 1841, however, William Tompkins used gas from one of his wells to evaporate salt. In 1844, likewise, George S. Lemon began selling oil from a shallow well he had completed in the Second Cow Run sand on his property along the Hughes River in Wirt County. In 1860 Rathbone Oil Company completed Rathbone 1 along the Little Kanawha River near Burning Springs, Wirt County, with substantial oil production in the Burning Springs sand at a depth of about 300 feet.

Period of 1860 to 1888: Following the Rathbone completion the oil industry flourished in the comparatively shallow Allegheny and Pottsville sands, mainly along the Burning Springs anticline, with little attention to gas, because the latter had no outlets of commercial distribution. Many exploratory wells were drilled in widely scattered localities in the three decades that followed the Rathbone discovery, but few were successful except along the 30-mile Burning Springs uplift and in the north panhandle.

Gas for Fuel

As of abbut 1888 the known oil territory covered 25,000 acres, or less, and was mainly confined to depths of about 1200 feet. Oil production in 1888, according to the U. S. Bureau of Mines, was only 119,000 barrels. The use of natural gas as domestic fuel began at Wellsburg, Brooke County, in 1884, and had spread to only a few communities by 1888. In 1885, Natural Gas Company of West Virginia was organized to supply domestic and commercial markets in the north panhandle from gas produced in Pennsylvania, Ohio and West Virginia. The U. S. Bureau of Mines figures the gas sold in 1888 had a value of $120,000. Assuming a value of 10 cents per Mcf the total gas sold would have been 1,200,000 Mcf.

Period of 1889 to 1917: In the early part of 1889 oil and gas production in sands below those of Pennsylvanian age was confined almost entirely to a few small isolated pools in the north panhandle where the Berea sand had been found productive at about 1200 feet.

In that year, however, systematic exploration for oil in the known Mississippian and Upper Devonian sands of Western Pennsylvania began under the direction of the late Dr. I. C. White and was rewarded by a Big Injun sand pool opener near Mannington, Marion County. In the wild scramble that ensued oil production rose to 544,000 barrels, and in 1891 had reached 2,406,000 barrels. In 1900 it reached its maximum of 16,196,000, but in 1917 had declined to 8,379,000 barrels.

Natural gas, as a commercial product, was slow to follow the lead of oil, although it flowed from the wells in greatly increased quantities. In 1890 the marketed production was only about 50,000 Mcf, with a value of $5400. In 1891 it was about 350,000 Mcf, and by 1897 had increased to only about 9,200,000 Mcf. In 1886 Carnegie Natural Gas Company was organized to supply the industrial needs of the Carnegie steel interests of the Pittsburgh region. Early production was obtained in Southwestern Pennsylvania but soon expanded into West Virginia. In 1898 Hope Natural Gas Company was organized to begin the exportation of gas to Ohio. Its gas, to a considerable extent, was obtained from gas wells developed by South Penn Oil Company, which was already engaged in a widespread search for oil.

Industry Expands

Other large gas companies soon entered the picture. Manufacturers Light and Heat Company was organized in 1903 and began exporting gas to Pennsylvania. Pittsburgh and West Virginia Gas Company, first organized as the Fairmont and Grafton Gas Company in 1894, became a large factor in the northward movement of gas. West Virginia Central Gas Company built a line in 1903 or thereabouts from Lewis County eastward to Elkins and Parsons and later extended it to Cumberland, Md.

All these early companies obtained their gas mainly from a solid group of ten or 12 counties southwest of the southwestern corner of Pennsylvania and situated along and on both flanks of the Appalachian Geo-Syncline where prolific supplies of both oil and gas had been found in the sands of the Pottsville, Pocono and Catskill series. The Catskill, or Venango, sands proved to be largely water-free and often productive in synclinal areas. Until about 1910 it was generally believed that little oil or gas could be found below the Bayard sand of the Catskill and very little exploration was done below that horizon.

In Southwestern West Virginia the development had an entirely different pattern. The Big Injun and Berea sands of the Mississippian were found to be largely saturated with salt water along the Appalachian Geo-Syncline, and the Catskill sands had thinned away to nothing. Production was mainly obtained from non-synclinal areas in the expanded Pottsville, Mauch Chunk and Greenbrier and in the Pocono. The Berea sand, at the base of the Pocono, was a deadline below which few operators ventured.

In this region, United Fuel Gas Company, organized in 1905, took an early lead in the development of gas; and South Penn Oil Company explored widely for oil. Various individuals, including E. M. Hukill, Wm. S. Edwards, and A. E. Humphreys, ventured boldly into new territory but generally stopped drilling at the Berea sand.

Production of natural gas in West Virginia climbs as development spreads in both lateral and vertical directions.

Deeper Drilling

As of about 1910 Hope Natural Gas Company began deeper drilling into the Chemung Series of the Upper Devonian in Harrison and adjacent counties and was rewarded by important gas discoveries in the Warren Second (Burnside), Speechley, Riley and Benson sands. The latter sand then became the new bottom in Northcentral West Virginia, although a few widely scattered tests were carried down to the Lower Devonian.

In 1917, West Virginia gas production reached an all-time high of 308,617,101 Mcf and far outranked all other states.

The same period of 1889 to 1917 was featured by the rise and decline of the carbon black industry of the state. Its

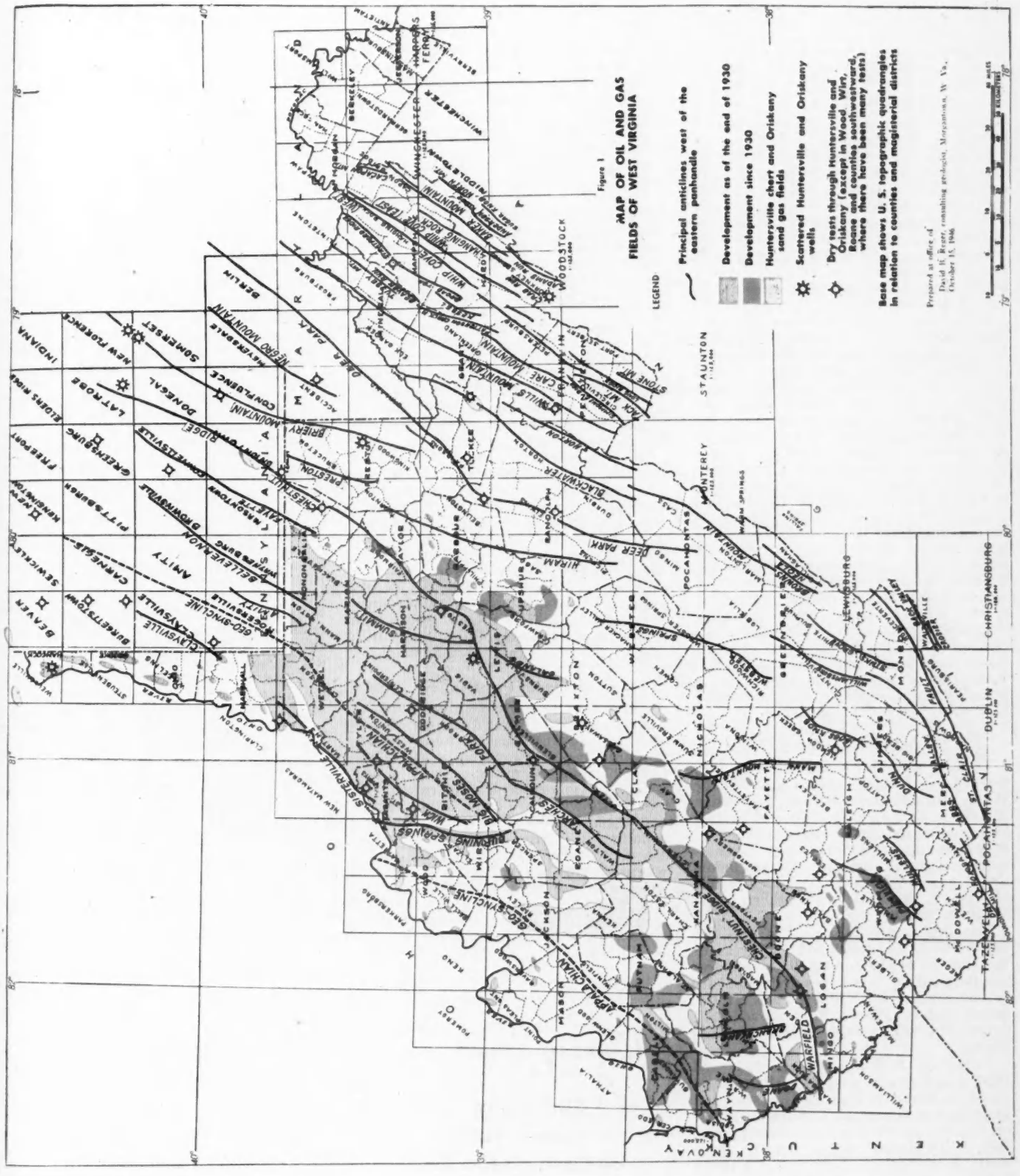


Figure 1
MAP OF OIL AND GAS FIELDS OF WEST VIRGINIA
LEGEND
Principal anticlines, west of the eastern panhandle
Development as of the end of 1930
Development since 1930
Huntersville chert and Oriskany sand gas fields
Scattered Huntersville and Oriskany wells
Dry tests through Huntersville and Oriskany (except in Wood, Wirt, Roane and counties southwestward, where there have been many tests)
Base map shows U. S. topographic quadrangles in relation to counties and magisterial districts
Prepared at office of David H. Beatty, consulting geologist, Morgantown, W. Va., October 15, 1946
WOODSTOCK
STAUNTON
MONTEREY
CHRISTIANSBURG
DUBLIN
POCAHONTAS
KENTUCKY
INDIANA
OHIO
WARFIELD
LOGAN
WILLIAMSON

growth was due to the fact that great quantities of cheap gas were available, and its decline was caused by increased prices due to the growing domestic and industrial demand developed by trunk pipe lines. Prominent among these carbon black operators were Godfrey L. Cabot, Inc., Columbian Carbon Company, and United Carbon Company, all of which are now extensively engaged in natural gas production.

1918 Drop

Period of 1918 to 1930: In 1918 gas production in West Virginia began a steady decline. In 1930 it was only 144,180,000 Mcf and in 1932 it had decreased still further to 100,540,000 Mcf. In the earlier years of the period the decline was due to various causes, including lessened oil exploration, and lessened lateral and downward gas exploration. In the later years it became precipitate because of nationwide industrial depression and loss of markets.

As of about 1924, however, gas was discovered in the Childres sand, or Brown Shale, of the Middle Devonian in Cabell County, approximately 800 feet below the Berea sand and much deeper in the rock column than any other known gas horizon in the state. This was a most important milestone of downward exploration and has caused the deepening of many old Berea wells and the drilling of extensive new areas in Cabell, Lincoln, Wayne and Putnam counties, previously regarded as mostly barren territory. The discovery, to a large extent, turned the attention of non-utility gas companies to the southwestern counties, their movements being naturally less restricted than those of the utilities having heavy pipe line investments and large consuming interests to be served in the older territory. As a result, gas exploration and production declined severely in the northern counties where small prospect of Middle Devonian gas was entertained.

Activity Declines

To a considerable extent the year 1930 marked a decided stagnation of the West Virginia gas industry. Depression had set in and the importance of Middle Devonian shale gas had been realized by only a few discerning operators. Furthermore, no general hope of new gas below the Benson in Northern West Virginia, and below the shale in Southern West Virginia, was entertained.

For this reason Figure 1 shows, by one pattern, the developed gas areas of the state as of the end of 1930, or thereabouts; and by another pattern the development as of October, 1946. If the latter pattern should be removed, the overall picture would shrink tremendously.

Period of 1931 to 1946: In 1933 and 1934, small quantities of Oriskany sand gas were found by Paul B. Grosscup and associates in Kanawha County northeast of Charleston at depths of about 5000 feet. Little attention was paid to these wells until one of them began flowing 150 barrels of oil per day late in November, 1934. This event caused a stampede of oil seekers who found no further appreciable amounts of oil but who developed the huge Charleston gas field of Kanawha, Jackson, Boone and Putnam counties, with nearly 1000 wells, presently covering about 150,000 acres, and still being extended. In a considerable part of this field the territory had previously been regarded as practically worthless because earlier drilling to the Berea sand had mostly found only dry holes.

The Charleston discovery has caused widespread Oriskany prospecting throughout the state. In the counties west of the Warfield-Chestnut Ridge anticline the results, outside of the Charleston field, have been disappointing, although there are isolated wells or shows in Hancock, Lewis, Wood, Jackson and Putnam counties. East of this anticline approximately 20 Oriskany tests have been drilled, only seven or eight of which were on known anticlinal structures, as shown on Figure 1. In 1934, Wm. E. Snee and others opened the Summit gas pool on the Chestnut Ridge anticline in Fayette County, Penn., about ten miles north of the West Virginia line, with gas production in the Huntersville chert and Oriskany sand; and in October, 1946, a late completion in the chert had an estimated flow of 60 million cubic feet. In 1944, The Ohio Oil Company drilled a successful Oriskany well on the Blackwater anticline of Tucker County, at a location selected by the writer, many miles southeast of any developed gas field. A second, and larger, well on the same structure seems to assure a fine development because of the known closure.

In October, 1946, Snee and Eberly completed a large well in the Huntersville chert, overlying the Oriskany, on the Briery Mountain anticline near Terra Alta, Preston County, about midway between the Summit and Blackwater pools. As of about 1936 Bergton Developing Company had already completed a small Oriskany gas well near Bergton, Rockingham County, Va., in a minor anticline of the highly folded Applachian ridges, approximately 30 miles southeast of the Blackwater development.

Mountain Possibilities

These four separate developments . . . Summit, Terra Alta, Blackwater and Bergton . . . all in sharply folded mountain anticlines and covering a lateral distance of some 80 miles, presage a new epoch of mountain exploration. As partly shown by Figure 1, there are many such folds as these in the surrounding territory of Pennsylvania, Maryland, West Virginia and Virginia where careful prospecting may develop substantial production in the Huntersville and Oriskany, and perhaps in the underlying Helderberg lime which is known to contain sandy zones that would apparently be porous. Furthermore, there may be justification for drilling to the still deeper sands and dolomites of the Silurian and Ordovician. Such exploration, if undertaken, should not be left to blind chance and most certainly should not be entrusted to geophysical mapping, which has apparently confused rather than clarified the structural pattern, as evidenced by numerous failures. It belongs more logically in the domain of experienced stratigraphers who have studied the Appalachian formations at their outcrops and are therefore in some position to judge their buried counterparts.

Coming Soon . . . .

"Utilization and Conservation of Casinghead Gas"

By Anthony Gibbon, Staff Writer

Watch for It!

Silurian Production

In the Silurian system some gas production has been found in the Newberg sand of Niagara age by Chartiers Oil Company in the western part of Wayne County and by Owens, Libbey-Owens Gas Department in the northern edge of Boone County. Little attempt has been made to extend these finds. In the Silurian, also, the White Clinton (White Medina) sand of Ohio was found by Owens to have a small gas production in the northern part of Boone County. Elsewhere in the state only a few wells have tested this sand, which apparently blankets the entire sub-surface area of the basin counties.

In the Ordovician one well by United Fuel Gas Company, in the western part of Roane County, reached the top of the Trenton lime at about 9000 feet, but did not go through it. The oil and gas possibilities of the Ordovician are therefore unknown. There may or may not be gas in the shales of the lower Maysville and Eden and there may or may not be gas or oil in the Trenton lime and in the sandy or dolomitic zones of the Beekmantown. The latter formation could be reached by 10,000 to 12,000 feet of drilling in some of the southwestern counties and by less drilling on some of the mountain anticlines. In view of the productive record of sands and limestones of similar age in the Mid-Continent province, it would appear that the Beekmantown may have possibilities in West Virginia.

As a result of the new lateral and downward development of this period gas production has risen from a 1932 low figure of 100,540,000 Mcf to a new high figure of 223,787,000 Mcf in 1943, with some slight decrease in 1944 and 1945.

Lateral expansion in recent years: Returning now to the more shallow sands, it will be apparent from Figure 1 that lateral extensions of gas production have been large since 1930, both within the known oil and gas regions and in the marginal or new territory southeast of the main fields. The Big Lime of the Mississippian, which in northern West Virginia is only 50 to 100 feet thick, mostly calcareous and almost entirely barren, thickens to 200 feet in the vicinity of Charleston and to 600 feet or more in Wyoming County, with many sandy zones.

Still farther south, in Mercer County, it is 1500 feet or more thick.

This formation, within the old fields, proved especially fruitful in gas over large areas in Putnam, Kanawha, Lincoln, Wayne, Boone, Logan, and Mingo counties. In the marginal belt it is now recognized as a substantial gas producer in Wyoming, Raleigh, Fayette, Clay and Nicholas counties. In the same marginal belt Logan, Boone, Raleigh and Wyoming counties have important new pro-

duction in the Maxton and other sands of the Mauch Chunk and there is now substantial Berea sand production along the Pineville anticline of Wyoming. For many years this county had a small Princeton sand (Mauch Chunk) production, but in 1930 and 1931 W. M. Ritter Lumber Company, on the advice of the writer, drilled two Big Lime wells on its own lands southwest of Pineville.

For ten years or more little additional drilling was done, but in the past few years there has been a spectacular development by strong gas operators on some of the various large coal land tracts of this county. It is now regarded as a major field, as witnessed by heavy drilling and pipe line budgets.

In Raleigh County important Big Lime and Maxton discoveries have been made by Godfrey L. Cabot, Inc., and Columbian Carbon Company. In Fayette, Clay and Nicholas the marginal belt, as first outlined by the Muddlety field of the latter county opened by Hamilton Gas Company on a suggestion published by the writer, is being rapidly filled by important fields. In Upshur the earlier discoveries of gas have been greatly widened; and in Barbour a similar expansion has begun. In the northern counties, near or adjacent to Pennsylvania and Maryland, an exploration campaign of large extent for Huntersville and Oriskany gas is bound to follow the fine discoveries in Tucker and Preston counties, with results that may rival or surpass the Charleston field.

Accomplished and Prospective Downward Expansion

Figure 2 shows a vertical section of the oil and gas sands that would be revealed by a drill hole started at the top of the highest hills in the northwestern part of Harrison county where there are heavy Permian sediments. In or near this territory there is accurate information down to the approximate base of the Silurian. The Ordovician part of the column is based partly on rather distant drill holes in Ohio, Pennsylvania and Kentucky, and partly on outcrops in the Appalachian ridges, 75 to 100 miles southeast of the developed fields. The figure shows, further, the downward expanding gas frontier as noted by discoveries in various sands. In 1860, for instance, gas was unknown below the Pennsylvanian. As of about 1895 it was abundantly found to the base of the Catskill. By 1916 it reached the lower part of the Chemung; by 1924 the Genesee; and by 1933 the Oriskany, which is nearly at the base of the Devonian. A few years previously, in 1930, gas was found in the Niagara formation of the Silurian. In 1939 production was revealed in the White Medina of the Silurian, below which little testing has been done.

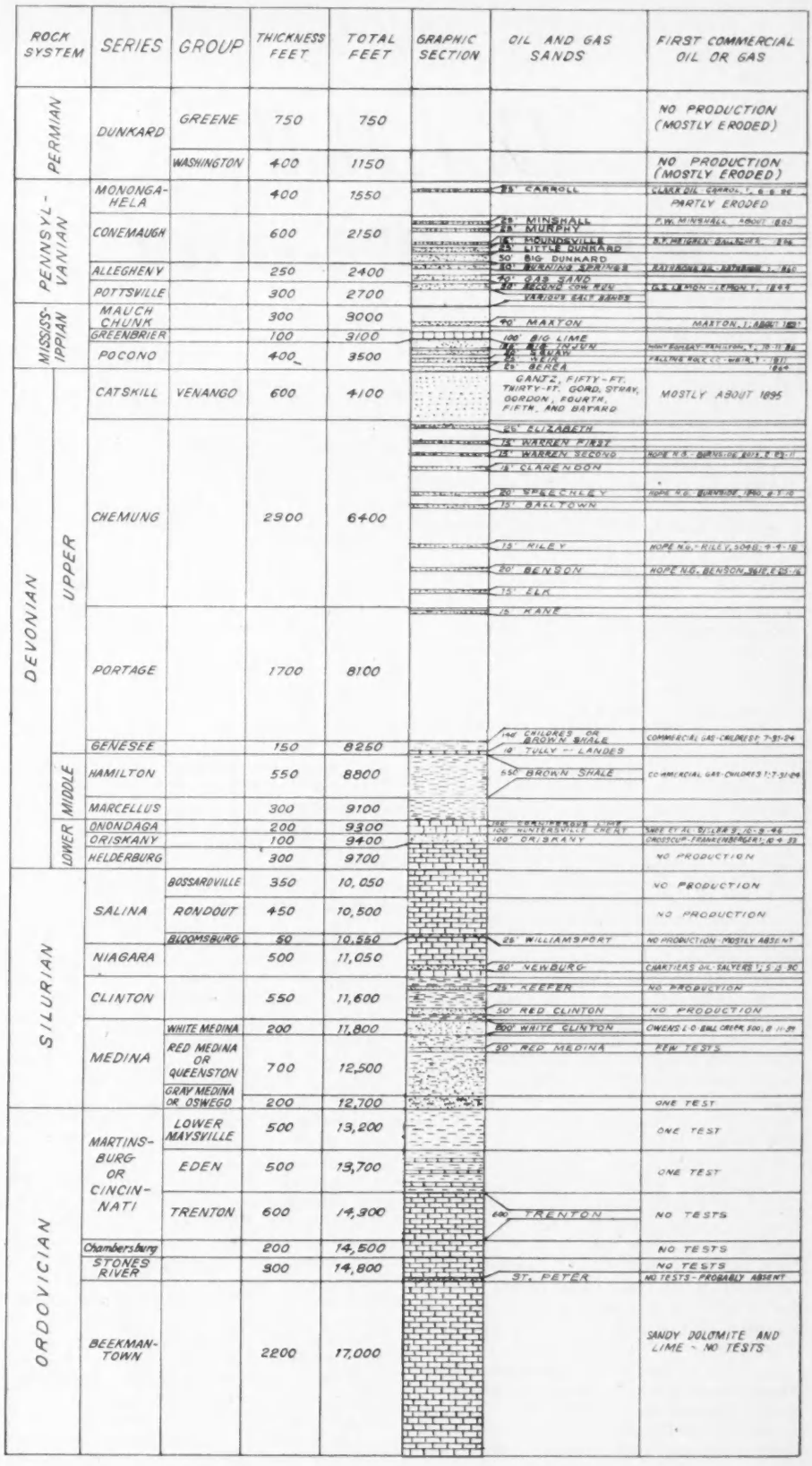


Figure 2. Proved and potential oil and gas horizons of West Virginia. (Thicknesses are as of the north central portion of the state.)

Prepared at office of David B. Reger, consulting geologist, Morgantown, W. Va.

Ordovician Possibilities

The question of Ordovician production will have to be answered by tests at localities where the exploration depths are more favorable than in the type locality of Figure 1. Such localities will be found along the major anticlines and in southwestern West Virginia where the Devonian and Silurian sediments have greatly thinned. On the Burning Springs anticline of Wood and Wirt counties, for instance, the Trenton can be tested by less than 10,000 feet of drilling and the entire Ordovician by about 12,000 feet. On the Warfield anticline of Mingo county the respective drilling depths would be about 7000 and 9500 feet; and on the Deer Park anticline of Randolph county they would be about 6700 and 9500 feet at the most favorable locality. Such depths are no longer forbidding.

In a future paper I shall discuss the Appalachian gas reserves, on which the presently published information is not at all adequate or satisfactory.

Burt Hull

MASTER PIPE-LINER

BURT HULL

HIS business card shows he is president of five major pipe line companies. His friends call him "Burt." The telephone book lists him as B. E. Hull, but the oil industry knows him as the "Master Pipe-liner."

And now he is off to the sand dunes of Saudi Arabia, on the first lap of a new pipe line building job, which, when completed, will chalk up approximately 10,000 miles of pipe line built under his direction.

The Middle East line, a 30-incher, to be built by Trans-Arabian Pipe Line Company, which Hull heads, will also be the world's largest diameter crude line, surpassing the 24-inch "Big-inch" carrier built under Hull's supervision.

Hull, born at Navasota, Texas, has been working on pipe lines since January, 1905.

When the Lucas gusher blew in at Spindletop on January 10, 1901, young Hull was a route carrier and city bill collector for *The Houston Post*. At the peak of the Spindletop boom, he was sent to Beaumont to collect for the advertisements published in the *Post* by the promoters and it was there that he was introduced to the color and excitement of an oil boom town. Hull can talk for hours telling true tales of the Beaumont boom and the oil booms that followed—Sour Lake, Batson, Mexia, Ranger, and even Tampico and Maracaibo.

He describes the boom at Batson as "where the town grew so rapidly, the jail wasn't large enough."

He entered Texas A. & M. College in September, 1901, and didn't see Beaumont or Port Arthur again until the summer vacation of 1903, when he landed a job with the T. & N. O. Railroad on construction of a branch from Nome to Sour Lake. The boom at Sour Lake was just starting. Most of the hangers-on had moved there from Beaumont.

In June, 1904, he was graduated from Texas A. & M. with an engineering degree and went to work for the Morgan's Louisiana & Texas Railroad and Steamship Company as a junior engineer at a salary of $55 per month. He had just learned to live comfortably on a diet of coffee, catfish, and bananas, when he was transferred to Beaumont and appointed instrument man with a salary of $75 per month on the Sabine-Dallas branch, which the S. P. had purchased from the Sabine & East Texas. After some legal ruling had made it probable that S. P. would have to sell the Sabine-Dallas branch, Hull was told he likely would lose his job. So during Christmas week, 1904, he applied for work with The Texas Company.

On January 1, 1905, he was hired as an engineer and draftsman by The Texas Company at a salary of $75 per month.

His first pipe line work was in late January, 1905, at Humble, Texas, where he helped complete a six-inch line to Sour Lake. In July, 1905, he was transferred to the Beaumont office as "acting" pipe line engineer. Later, he was sent to Indian Territory to start field location survey for the eight-inch line to Humble. Of this work he says "the right-of-way agents and the pipe line construction crews were right on my heels all the time."

After working at West Dallas, he was sent to Port Arthur in 1908 as works engineer and under R. C. Holmes learned how "to perform the more simple tasks satisfactorily." In January, 1911, he was transferred to Houston as chief engineer of the refining department, and in July, 1922, was sent to Tampico as manager of the company's Mexican subsidiary.

Becomes Firm Head

In 1926, Hull returned to Houston and in the same year became president and director of The Texas Pipe Line Company, where he began to compile his remarkable record of pipe line construction. Today, he is the president of The Texas Empire Pipe Line Company, Texas-New Mexico Pipe Line Company, Kaw Pipe Line Company and Trans-Arabian Pipe Line Company, as well as The Texas Pipe Line Company.

When enemy sinkings of tankers plying coastal and Atlantic waters became so numerous during World War II, it became necessary to construct a non-sinkable pipe line between Southwest oil fields and East Coast refineries. With such a project approved, it was natural that the government called on the "Master Pipe-liner" to do the actual construction work. As vice president and general manager of War Emergency Pipeline, Inc., Hull was the "big stroke" on the "Big-inch."

He and his construction crew established a remarkable record in laying this giant oil carrier which made a vital contribution to Allied victory. Also, under Hull's direction the government constructed the war emergency 1475-mile "Little Big-inch" products line.

In recognition of his work on the "Big-inch" and "Little Big-inch" pipe lines and other contributions to the development of the Texas oil industry, Hull was the recipient of the Distinguished Service Award by the Texas Mid-Continent Oil & Gas Association in 1943.

One of Hull's chief characteristics is his jovial good humor, and his ready wit. This wit is of the pipe line variety which shines better in masculine company than in mixed and is almost invariably connected with an anecdote about some fellow oil man.

It is said his speech before the Old Timers' Club down at Port Arthur a year or two ago is a gem, and so it is. He has given us permission to print it but we haven't been able to wash it up enough to satisfy some of THE OIL WEEKLY subscribers who think that the "Squeaks of the Bull Wheel" and Holly Reavis' old time "Tank Strapper Column" fit better into the Police Gazette rather than a refined educational organ such as THE OIL WEEKLY.

The key to Hull's outstanding record as a pipe line builder is probably his keen ability for setting up an organization and knack of handling men. Workers on the war emergency projects were known as "Burt Hull's men" and liked it. His attitude toward his "boys" was demonstrated more than once during the construction of the "Big-inch" line. At one time when his men became involved with a certain sect at Little Rock a full investigation was ordered by the then Secretary of the Interior Ickes. Hull's written report to Ickes on the incident is a genuine pipe line classic.

While talking with Hull in his office recently, he picked up the phone and talked long-distance with a man he wanted to do the surveying work on the Middle East carrier.

"Hello, Bill," the conversation went, "How would you like to survey the route of a pipe line in the Middle East?" Hull asked. Apparently getting an affirmative reply, Hull continued, "All right, the job is yours. Get a good rest and meet me in my office in two weeks and we'll get things started."

Hull later said he knew the surveyor could do the job and wanted him.

That's the way Hull organizes. He knows the man for the job and lets the man do the job.

And that's why he has become the "Master Pipe-liner" of the petroleum industry.

FUNDAMENTALS OF INDUSTRIAL

Accident Prevention

Part 15

Employer Leadership

By C. L. HIGHTOWER
Safety Director, United Gas Pipe Line Company
and Union Producing Company

WE ARE today but a few years removed from the master and apprentice era in industry. The problem of personnel management and control under the master and apprentice regime was comparatively simple. The master mechanic had immediate supervision over one or two apprentices and the employer had a close contact with all employes since business was done on a small scale and each establishment employed a limited number of workmen.

In those days the employer had an opportunity to form a personal acquaintance with each man. He knew Bill's likes and dislikes. He was informed of his financial condition and knew whether or not the children had the measles. In fact, he knew as much about Bill as Bill's fellow workers knew and to Bill the "Boss" was just one of the boys. Under this arrangement of personnel control, misunderstandings were few and production methods being less complicated than today, business as a whole ran along smoothly.

Then came big business, the machine age and mass production. The employer who once knew all his workmen by their first names found himself removed from this personal contact. Personnel now numbered hundreds and even thousands, where before it was only ten or 20. Of course, it required time for this advancement in business, but the change took place over a few short years and without its being fully realized by industrial leaders. These growing organizations demanded supervision both as to men and methods, and since the task was beyond the employer, business was segregated into departments and divisions and the positions of department head, superintendent, and foreman were created. The supervisor of the particular department or crew then became, so far as the workmen were concerned, the company and the "Boss." Upon the shoulders of this supervisor fell the responsibilities of making personal contact, building morale, perfecting methods and training workmen. These same responsibilities exist today, only they are greater. The demands of a supervisor are greater than the mere overseeing of work. He must be a leader of the highest type, capable of inspiring confidence, developing loyalty, perfecting methods, and have the ability to bring out the best there is in a man. The supervisory force of any organization is the backbone of that organization and either makes or breaks it.

More Accidents

With mass production and machines, our accident frequency increased. Business was speeded up and the man was taken from the work bench and his hand tools and assigned to the operation of complicated machinery. Guards were installed, machines improved, and yet we had broken and crushed workers. It is true that these accidents were occurring in connection with machines, but the machines were not responsible; rather, we had not progressed as fast in training men as we had in building machines. It was only after we turned our attention to educating and training our men that any appreciable reduction in accidents was noticeable. But even today we are still far behind. Our workmen are not developed and trained to the extent that our machines are perfected.

In considering then the question of "getting results" from accident prevention effort, this thought should be foremost: "We must better train and develop the individual workmen."

Conditions vary, of course, in each organization and a plan suitable for one company may not be practical for another. There are, though, certain fundamental practices that can be followed by any supervisor in any organization with good results.

Each job has its particular requirements, and we should know what the demands are on the man—what physical, mental or temperamental qualifications he must have to discharge properly his duties. A man physically, mentally and temperamentally suited for a pumper might not be so suited for a truck driver or a plant operator. Do you consider this in hiring a man? Or have you been trying to fit round pegs into square holes?

This is the first and most important question, both from an accident prevention and general efficiency standpoint and since the estimated cost of employing the average workman and getting him placed on the job is $200, is it not worth your time and trouble to question the prospective employe and investigate his qualifications? When you buy wire rope, pumping engines or compressor units, don't you demand certain specifications? Yes. Then isn't the man who is to use, operate and maintain this equipment equally as important? Spend a little more time in hiring a man and get the right man for the right place.

You know they used to say the easiest way to teach a boy to swim was to throw him in where he either had to swim or drown. Some supervisors use the same method in placing men in their organization. They are thrown into the work and it's up to the man to make good or else. But else what? Else damage equipment, injure himself or the other fellow, and cause disruption in general. It may be a good plan in the mind of some, but we can't get away from the fact that it is a costly one. How much better it would be to take the new man out to his job—it matters not whether he has drilled all of his life or operated a gasoline plant since he was a boy—and introduce him to the men he is to work with, tell him of the known dangers of the work. It only takes a little time, and one string of tools, one compressor or one life will pay for the cost of introducing hundreds of men.

It doesn't matter what you are hiring a man to do. If he is merely going to dig a ditch, it will pay you to take the time to tell him how to hold a shovel or a pick; how to shore a ditch and the distance he should maintain from the other fellow. You wouldn't install an engine with any hope of its operating without putting in a good substantial base. Then why not give the employe a firm footing to start with? Give him an even break.

Maintaining Morale

The most difficult and yet the most important thing required of a supervisor is to develop and maintain morale—keeping the worker satisfied, loyal and intently interested in his job. Some supervisors say, "Oh, well, I can't keep the men satisfied because I can't pay them enough money." Men have to live, but they don't work for money alone. A small percentage of labor turnover is due to workmen seeking bigger wages. A man will stay on a job where his surroundings are pleasant and agreeable and he likes his "Boss" for a lot less money than he can get elsewhere.

Granted that it's no easy task. It's another supervisory responsibility that requires the highest type of leadership. The relationship of loyalty, good feelings, etc., to the accident rate is so well known that it's hardly worth mentioning. We have accidents where unhealthy employe relations exist, and we do not have them where such conditions do not exist.

We have recently come to know of the no-injury accident. That is, an accident happens maybe many, many times before someone is hurt. Maybe a board or wrench falls from the tubing board ten times without striking anyone. Every time it falls an accident occurs, and it is but good fortune that no one is injured. What is our usual attitude toward such an experience? We shake hands with ourselves and say, "My, we were lucky nobody was hurt there." But do we accept the warning and stop the practice of leaving loose boards or wrenches on the tubing board? No, we do not, and the practice is continued until *someone is hurt.* You may feel that you have done your duty when you tell the workmen to dis-

■ CONTINUED ON PAGE 46

Quick Freezing

OF CORES PRESERVES FLUID

By JOHN D. WISENBAKER
Core Laboratories, Inc.

FOR many years cores have been cut from oil and/or gas-bearing formations and analyzed for porosity, permeability, oil and water saturation and other properties in order to obtain data for application toward (1) better well completion, (2) more accurate estimation of recoverable oil and gas, and (3) more efficient production of petroleum reservoirs.

The pore space in an oil-bearing formation is normally filled with interstitial (connate) water, and oil with its dissolved gas. During drilling operations where water-based mud is the drilling fluid, a water front precedes the cutting face of the bit and displaces formation oil, reducing the oil saturation to a quantity normally found after effective water drive. The pore space in a core, before it is raised from the bottom of the well, is filled with oil and its dissolved gas, connate water, and drilling water which has displaced formation oil. As the core is raised to the surface, the gas in solution in the residual oil expands as pressure declines and forces part of the drilling fluid from the pore space of the core. Upon arrival at the surface the pore space is occupied by residual oil, connate water, drilling fluid, and void space created by the expanding gas.

The above process is sufficiently consistent for any fixed set of reservoir conditions so that measurements for oil and water saturation, permeability, and porosity made on a fresh core immediately after it reaches the surface, can be used to interpret accurately the type and quantity of production to be expected and, together with other data, to calculate accurately the amount of recoverable oil and/or gas in the reservoir.

On reaching the surface the core, due to capillarity, ordinarily commences to absorb water from the drilling mud, and on exposure to the atmosphere, starts losing oil and water by evaporation. These effects result in a substantial deterioration in value of a delayed analysis.

For several years it has been common practice to place a laboratory at the well site in order to provide immediate analysis on fresh cores. This practice occupies the full time of a field crew, and limits the service of each laboratory to one well at a time.

A research project was initiated for the development of a method to provide reliable analysis on fresh cores without the necessity of having a field laboratory at the well site except in cases where immediate results of analysis are needed to direct coring schedules or to aid in well completion.

General

The development of a method for preserving the fluid content of fresh cores by quick freezing is described below.

The idea of quick freezing was believed to be a practical method of preserving the fluid content of cores because freezing effectively anchors each particle of oil and water in the particular part of the core it occupies on being taken from the well. Some concern was felt, however, on what effect quick freezing might have on permeability, porosity, and other physical characteristics of oil and gas bearing rock. A drastic alteration of the sample was not expected because the particles of water are dispersed throughout the core and the expansion due to freezing is cushioned by the oil and gas content of the core. Porosity was not expected to change appreciably because, even with considerable internal fracturing which might cause a substantial change in permeability, no solid matter would be added or removed.

THE author was graduated from S.M.U. in 1939 with a B.S. degree in mechanical engineering. He was employed by Core Laboratories, Inc., as a field engineer in core analysis and bottom hole sample and pressure work until September, 1942. He entered the U. S. Navy and served 41 months as an engineering officer in the submarine service. Since his release in January, 1946, he has been employed in Core Lab's research department and has worked on relative permeability and capillary pressure apparatus and the development of new techniques and equipment relative to petroleum reservoir engineering.

John D. Wisenbaker

Changes in Permeability and Porosity Caused by Quick-Freezing Consolidated Sand Cores Fully Saturated with Water

A maximum change in permeability and porosity was expected by quick freezing samples fully saturated with water because the expanding ice would not have void space, which is usually present in fresh cores taken from oil- or gas-bearing formations, to accommodate any appreciable expansion.

With these ideas in mind, samples of sand were selected from several oil fields for the purpose of determining the change in permeability and porosity caused by quick-freezing samples fully saturated with water.

Twenty-five cylindrical samples of consolidated sand, two centimeters in diameter and approximately two centimeters long, with a permeability range of from a fraction of a millidarcy to several hundred millidarcys, were selected. The samples were extracted by positive flushing with carbon tetrachloride and dried at 280° F. Permeability measurements were made by direct measurement of rate of air flow. Samples were accurately weighed, evacuated, saturated with distilled water and reweighed for porosity determinations. Care was taken at all times to protect the saturated samples from the atmosphere by keeping them sealed in weighing bottles. The samples were wrapped in a single layer of paper and covered with several inches of dry ice and allowed to remain frozen for 16 hours. The samples were removed from the dry ice, thawed, and dried. Permeability and porosity determinations were again made in the manner already described.

The porosity and permeability of each

TABLE 1

Permeability and porosity values measured on identical consolidated sand samples fully saturated with water before and after quick freezing.

Permeability in Millidarcys		Porosity, Percent	
Before Freezing	After Freezing	Before Freezing	After Freezing
138	164	19.4	19.9
4.50	8.93	19.1	20.5
335	352	16.3	16.5
3.60	7.06	17.8	19.1
5.00	7.83	16.5	17.0
5.36	9.30	19.2	20.1
117	132	23.0	23.5
36	38	17.2	17.4
15	17	14.3	14.6
450	457	16.8	16.9
25	27	13.1	13.3
151	160	21.1	21.2
303	313	18.7	18.6
101	103	14.4	14.9
557	561	20.6	20.6
921	940	21.9	21.7
113	120	20.3	20.5
36	54	23.2	23.4
14	14	11.4	11.4
33	36	23.0	23.0
1.32	1.40	04.5	0.48
10.1	10.6	14.9	14.9
2.63	4.40	16.3	16.0
.099	.110	03.3	0.37
16	32	24.7	24.2
136 Average	143	17.24	17.51

CONTENTS

sample measured before and after quick freezing is shown in Table 1.

Changes in Permeability and Porosity Caused by Quick Freezing Consolidated Sand Cores Partially Saturated with Gas

Most cores from oil- and gas-bearing formations reach the surface partially saturated with gas. In view of this fact, it was thought advisable to determine the change in permeability and porosity caused by quick freezing samples of this type. Thirteen consolidated sand samples were selected from various oil fields for this purpose.

Permeability and porosity measurements were made as described earlier. Samples were saturated with water, weighed, and exposed to the atmosphere until part of the water in the pore space of the sample had evaporated. Gas saturations were determined by weighing. The cores were then frozen for approximately 20 hours, thawed and dried, and permeability measurements were again made. Samples were resaturated and porosity determinations were made in the usual manner.

The above procedure was repeated twice with decreasing gas saturations in an effort to compare permeability and porosity values before and after quick freezing for several gas saturations.

No appreciable change of porosity was observed with the completion of the first set of porosity measurements on samples partially saturated with gas, as was the case on the first 25 samples which were fully saturated with water. Consequently, porosity was not measured during the last two experiments. The gas saturation was zero on the last experiment.

Data for these measurements are shown in Table 2.

A comparison of permeability values below 600 md. before and after quick freezing samples fully saturated with water is shown graphically in Figure 1. A comparison of porosity values before and after quick freezing for samples fully and partially saturated with water is shown graphically in Figure 2.

Permeability values from Tables 1 and 2 were grouped according to permeability range and gas saturation, and average permeability values were calculated for samples with more and less than 10 millidarcys for various average gas saturations. These data are shown in Table 3.

Average values in Table 3 indicate the following changes may be expected by quick freezing core samples partially or fully saturated with water:

1. Samples fully saturated with water and with permeability less than ten milidarcys show an average increase in permeability of 47.3 percent.
2. The permeability of samples with less than ten millidarcys and with 10.9 percent average gas saturation show an average increase of 1.86 percent.
3. Samples fully saturated with water with permeability of more than ten millidarcys show an average increase in permeability of .35 percent.
4. Samples with more than ten millidarcys and average gas saturations of 16.0 percent and 32.8 percent show an average increase in permeability of 3.06 percent and 2.54 percent, respectively.

The much smaller effect of freezing on samples with over 10 percent gas saturation may possibly be due to the fact that water expands approximately 9 percent on freezing.

Porosity values from Tables 1 and 2 were grouped according to gas saturation. All samples with no gas saturation were averaged as a group, and all samples having gas saturation were averaged as a separate group. The average porosity values for each group before and after freezing are shown in Table 4.

TABLE 2

Permeability and porosity values measured on identical samples of consolidated sand partially saturated with gas before and after quick freezing.

Sample No.	Gas Saturation	Permeability in Millidarcys		Porosity, Percent	
		Before Freezing	After Freezing	Before Freezing	After Freezing
1	55.8	2.68	2.67	9.48	9.32
2	64.0	3.77	4.15	8.29	8.22
3	55.1	3.51	3.76	9.55	9.50
4	47.5	29	28	11.50	11.48
5	45.2	7.05	6.58	10.45	10.44
6	25.4	102	99	21.80	21.80
7	27.5	325	338	21.80	21.80
8	36.4	42	43	13.76	13.60
9	27.9	80	79	18.61	18.50
10	44.6	188	198	14.19	14.15
11	24.9	1529	1542	21.00	20.70
12	29.5	100	101	18.70	18.50
13	32.0	1839	1970	19.20	19.30
Average	39.7	324	340	15.25	15.18
1	9.75	2.67	2.59	....	....
2	11.2	4.15	3.85	....	....
3	11.8	3.76	3.92	....	....
4	11.7	28.5	29	....	....
5	10.9	6.58	7.12	....	....
6	15.5	99	99	....	....
7	14.6	338	361	....	....
8	23.0	43	45	....	....
9	17.8	79	83	....	....
10	9.15	198	213	....	....
11	16.3	1542	1595	....	....
12	18.7	101	104	....	....
13	17.2	1970	2010	....	....
Average	14.4	340	351	....	....
1	0	2.59	2.82	....	....
2	0	3.85	3.90	....	....
3	0	3.92	5.25	....	....
4	0	29	30	....	....
5	0	7.12	8.00	....	....
6	0	99	102	....	....
7	0	361	359	....	....
8	0	44	44	....	....
9	0	83	83	....	....
10	0	213	217	....	....
11	0	1595	1427	....	....
12	0	104	101	....	....
13	0	2010	2030	....	....
Average	....	351	340	....	....

TABLE 3

A comparison of average permeability before and after quick freezing for samples with various average gas saturations.

Permeability Range	Total No. Samples	Average Gas Saturation, Percent Pore	Average Permeability in Millidarcys		
			Before Freezing	After Freezing	Percent Change
Permeability less than 10 Millidarcys	11	0	3.66	5.36	47.3
Permeability more than 10 Millidarcys	27	0	293	294	.35
Permeability less than 10 Millidarcys	4	10.9	4.29	4.37	1.86
Permeability more than 10 Millidarcys	9	16.0	489	504	3.06
Permeability less than 10 Millidarcys	4	55	4.25	4.29	.94
Permeability more than 10 Millidarcys	9	32.8	512	525	2.54

TABLE 4

A comparison of average porosity values before and after quick freezing consolidated sand samples fully and partially saturated with water.

No. of Samples	Average Gas Saturation	Porosity, Percent Pore		
		Before Freezing	After Freezing	Percent Change
25	0	17.21	17.51	1.74
13	39.7	15.25	15.18	— .46

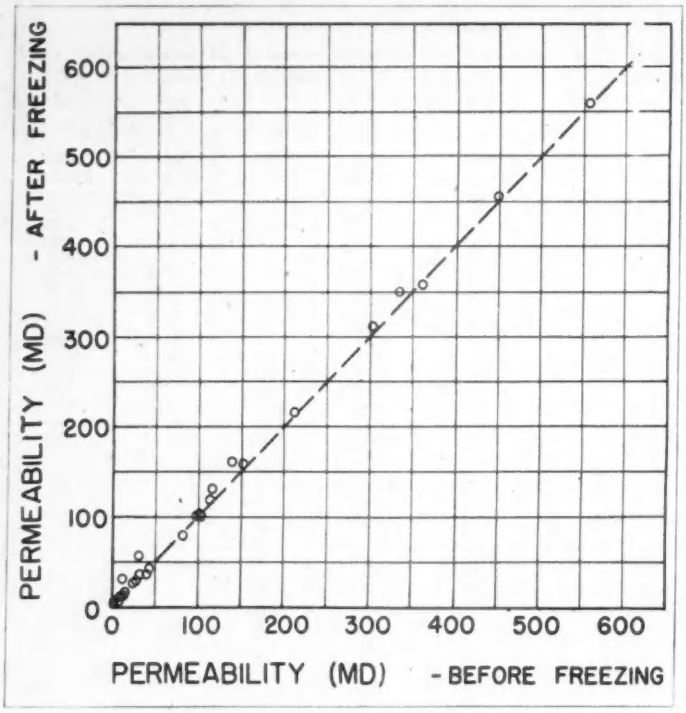


Figure 1. A comparison of permeability measurements on identical core samples before and after quick freezing.

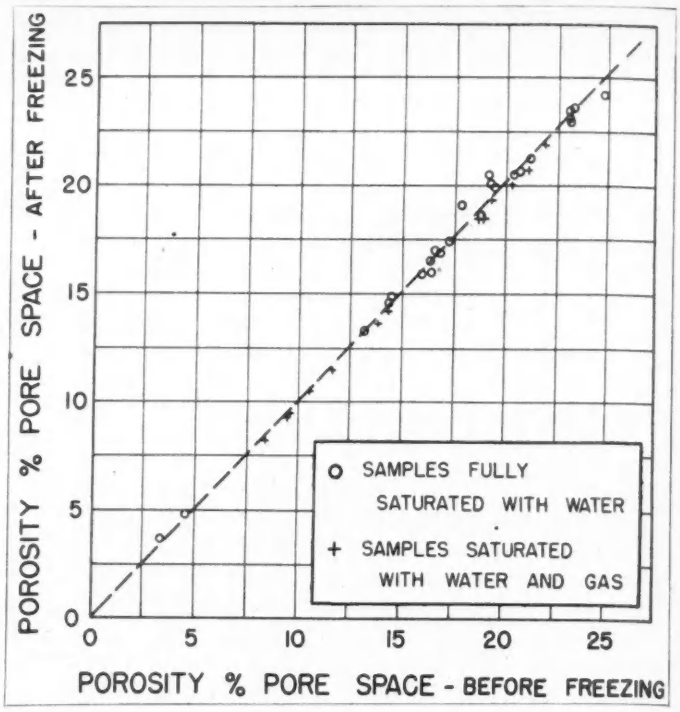
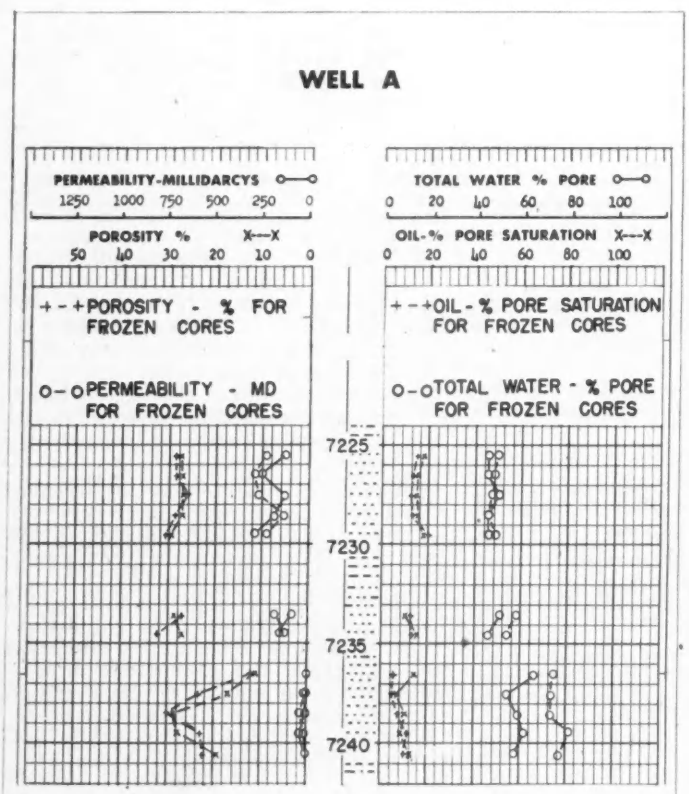
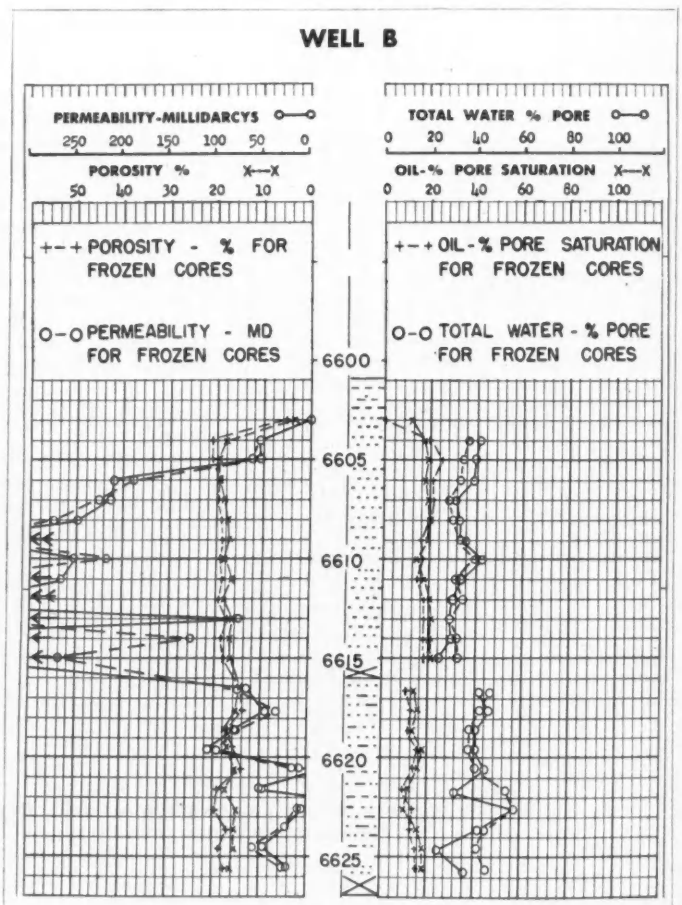


Figure 2. A comparison of porosity measurements on identical core samples before and after quick freezing.


WELL A
PERMEABILITY-MILLIDARCYS
POROSITY %
+ - + POROSITY - % FOR FROZEN CORES
o - o PERMEABILITY - MD FOR FROZEN CORES
TOTAL WATER % PORE
OIL-% PORE SATURATION
+ - + OIL - % PORE SATURATION FOR FROZEN CORES
o - o TOTAL WATER - % PORE FOR FROZEN CORES
7225
7230
7235
7240

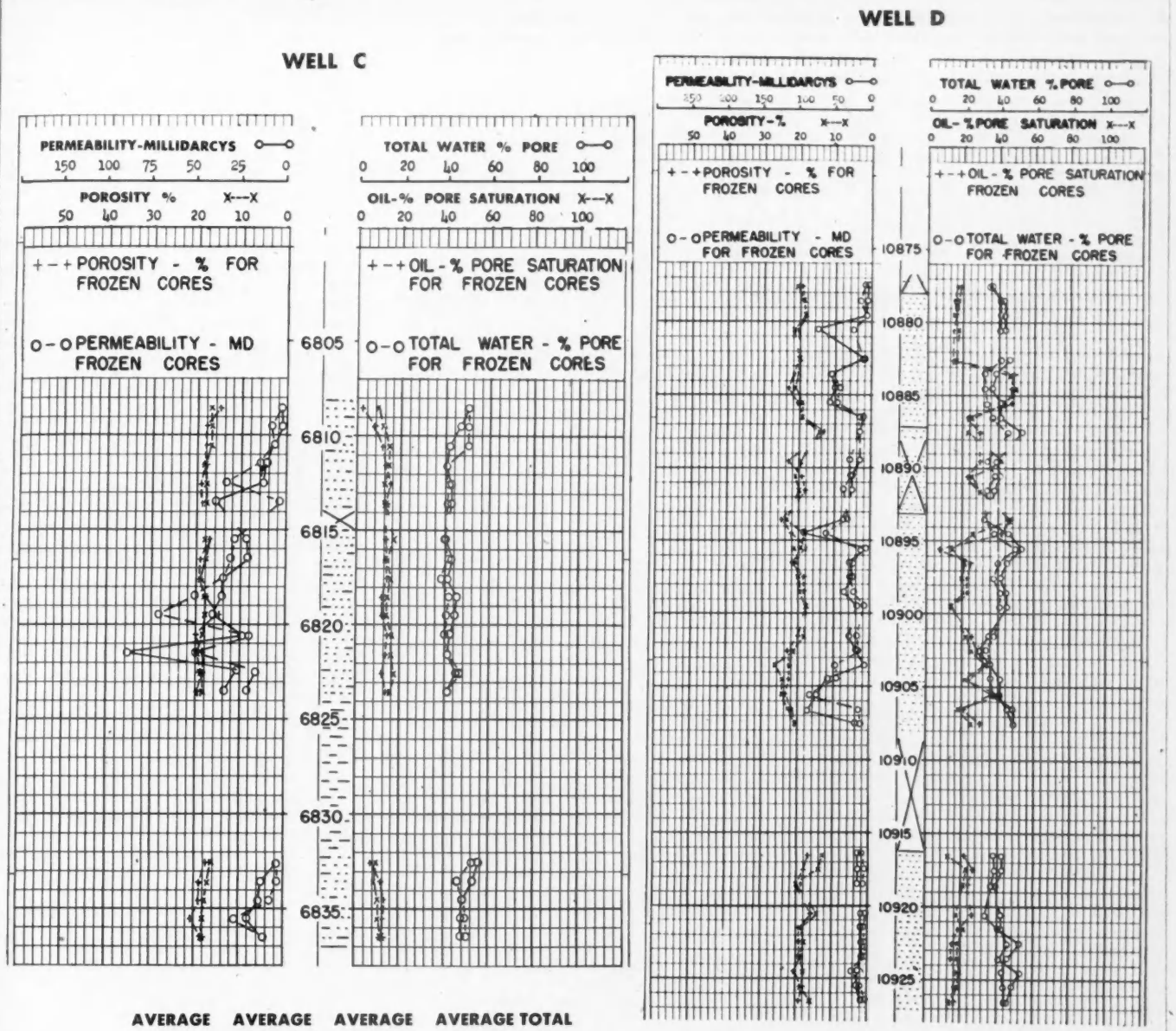
	AVERAGE PERM.	AVERAGE POROSITY	AVERAGE OIL SAT.	AVERAGE TOTAL WATER SAT.
Regular Analysis	111	24.1	12.6	53.6
Frozen Cores	125	26.5	11.8	58.2

FIGURE 3



	AVERAGE PERM.	AVERAGE POROSITY	AVERAGE OIL SAT.	AVERAGE TOTAL WATER SAT.
Regular Analysis	167	17.2	16.2	37.0
Frozen Cores	175	17.5	16.1	38.7

FIGURE 4



	AVERAGE PERM.	AVERAGE POROSITY	AVERAGE OIL SAT.	AVERAGE TOTAL WATER SAT.
Regular Analysis	22.3	17.8	13.0	45.4
Frozen Cores	22.7	18.2	11.5	44.7

FIGURE 5

	AVERAGE PERM.	AVERAGE POROSITY	AVERAGE OIL SAT.	AVERAGE TOTAL WATER SAT.
Regular Analysis	26.0	19.1	23.1	41.2
Frozen Cores	24.9	19.5	24.2	38.7

FIGURE 6

A study of this table indicates:

1. Porosity on samples with zero gas saturation shows an average increase of 1.74 percent of porosity.
2. Porosity on samples with an average gas saturation of 38 percent shows an average decrease of 0.46 percent of porosity.

Changes in Permeability, Porosity, Oil and Water Saturation Caused by Quick Freezing Fresh Sand Cores

No appreciable change in permeability and porosity was observed from determinations made on samples partially and fully saturated with water before and after quick freezing. It was then decided to compare results of permeability, porosity, oil and water saturation measurements obtained from well site analysis on fresh cores with results obtained on samples selected as nearly representative as possible to those analyzed at the well after they had been frozen for an appreciable length of time.

Four wells were selected for this purpose. One is on the Texas Gulf Coast, 2 in the Mid-Continent area, and 1 in California.

It was thought advisable to split each core through the longitudinal axis, use one half for the well site analysis and freeze the other half for subsequent analysis.

The first well analyzed was located in the Texas Gulf Coast area. The wire line cores taken in this case were too small to permit the selection of two samples from the same piece of core. Adjacent samples were therefore selected from the same foot of core. One part was analyzed in the field laboratory immediately after being taken from the well. The adjacent part was cleaned of drilling mud and promptly wrapped in a single layer of paper, on which was marked the depth from which it was selected, placed in an insulated box, covered with several inches of dry ice and allowed to remain frozen for approximately 20 hours. Twelve samples were frozen in this manner. All samples were removed from the freeze box at the same time and exposed to the atmosphere. Frost, which quickly collected on the surface of each sample, was removed from pieces of core selected for water determinations by brushing with a fiber brush. After approximately half the samples were prepared for analysis the frost, previously noticed on the surface of the remaining samples, was ob-

TABLE 5

A comparison of average data for permeability, porosity, oil and water saturation for four wells taken from well site analysis and from subsequent analysis data for frozen samples.

Well Designation	No. of Samples Analyzed	Average Permeability		Average Porosity		Average Oil Saturation		Average Total Water Saturation	
		Regular Analysis	Frozen Samples	Regular Analysis	Frozen Samples	Regular Analysis	Frozen Samples	Regular Analysis	Frozen Samples
Well A.....	12	111	125	24.1	26.5	12.6	11.8	53.6	58.2
Well B.....	22	167	175	17.2	17.5	16.2	16.1	37.0	38.7
Well C.....	20	22.3	22.7	17.8	18.2	13.0	11.5	45.4	44.7
Well D.....	37	26.0	24.9	19.1	19.5	23.2	24.2	41.2	38.7
Overall Weighted Average....	.....	70.5	73.9	19.0	19.7	17.9	17.8	42.7	42.6

served to have thawed, indicating that the temperature of the outside of each sample had risen above the freezing point. The remaining samples selected for water content determination were wiped with a dry cloth but a considerable amount of water was absorbed by the partially thawed surface of each sample. The effects of water thus collected by the last several samples was quite noticeable in the final analysis results. Total water saturation measured on frozen and non-frozen samples is in fairly close agreement for the first few samples, but diverges in the last samples.

Permeability, porosity, oil and total water saturation plotted versus depth from well site analysis and from analysis of frozen cores are shown in Figure 3.

Wells B and C, located in the Mid-Continent area, were cored with conventional barrels which cut cores 3½ inches in diameter. In both cases a piece of core approximately four inches long was selected for each foot, carefully cleaned of drilling mud, and split through the longitudinal axis. One-half the core was analyzed immediately at the well site in a portable field laboratory for permeability, porosity, oil and water saturation, and the other half was wrapped in a single layer of paper and placed in an insulated box beneath several inches of chipped dry ice. Care was taken to mark the correct depth represented by each sample on the sample wrapper. The particular section of each sample selected for permeability, porosity, oil and water saturation for the well site analysis was suitably marked opposite the point selected on the half taken for freezing in order to assure representative samples for the second analysis.

The frozen samples from Wells B and C were analyzed approximately 30 hours after freezing. In each case, laboratory equipment and technique employed was, as nearly as possible, identical to that used for well site analysis. Cores were removed from the freeze box singly and prepared for analysis, thus preventing any partial thawing of the sample surface. Care was taken to remove all frost from samples selected for the determination of water saturation.

Values for permeability, porosity, oil and total water saturation are plotted vs. depth for the well site analysis and the analysis of the frozen samples in Figures 4 and 5. Average data are shown at the bottom of each figure.

Samples from Well D were selected from a well in California in the same manner as described above. The cores were frozen at the well site and packed with approximately 75 pounds of dry ice in an insulated box, then shipped to a core analysis laboratory where they were kept frozen for 30 days. The samples were then removed from the freeze box and analyzed as described.

Values for permeability, porosity, oil and total water saturation for well site analysis and the frozen cores are plotted graphically vs. depth in Figure 6. Average values are listed on the lower part of the figure.

In Table 5 is a summation of average data for the four wells from which cores were frozen for subsequent analysis and comparison with results from well site analysis.

The samples selected for freezing from Well A are not thought to be representative in comparison with those analyzed at the well because the small diameter core made it necessary to select the sample for freezing immediately below or above the one used for well site analysis. Also, as pointed out earlier in this paper, the surface of the last several samples was allowed to thaw and absorb water collected from the atmosphere, thereby increasing the water saturation beyond the amount which normally would have been measured.

The results from the analysis of frozen cores selected from Wells B, C, and D are in very close agreement with values measured by well site analysis.

Summary

Permeability and porosity measurements have been made on consolidated sand cores, selected from various oil fields, before and after quick freezing. The measurements were made on samples with gas saturation varying from zero to approximately 55 percent.

No appreciable change in porosity was caused by quick freezing samples fully or partially saturated with water. No appreciable change in permeability was noticed for samples with 10 percent or more gas saturation. Samples fully saturated with water but with a permeability of more than 10 millidarcys showed no substantial change due to quick freezing. Samples fully saturated with water and with permeability of less than 10 millidarcys showed a same change in permeability.

Fresh core samples adjacent to those analyzed at the well were frozen and analyzed at times varying from 20 hours to 30 days after freezing. No appreciable change in permeability, porosity, oil or water saturation due to quick freezing was in evidence.

It is concluded that physical characteristics and fluid content of cores can be preserved almost indefinitely by quick freezing fresh samples when they are taken from the well.

Accident Prevention

■ CONTINUED FROM PAGE 41

continue such a practice, but you have not. It's up to the gang pusher or other individual in charge to watch for such unsafe practices and stop them before an accident occurs.

Closer Supervision

Some workmen require more time and effort to train and develop than others. This can be due to many different causes, but we should investigate each case and determine the cause for the man's failure to respond. Some supervisors are too quick to discharge a seemingly unresponsive worker. It's easier to fire him than it is to train him. But is it right? What about the cost of replacing him, and what is the probability of getting another just like him?

Isn't it true also that we owe the man something—that we should be more charitable and considerate?

Disciplinary action should be used as a last resort either in training a man in safety or other phases of his job.

The supervisor who carefully selects his men, properly introduces them to their jobs and instructs them in their work, closely supervises and attempts to correct unsafe practices, develops loyalty and interest on the part of the employe, and patiently trains and instructs his men rather than using the "pink slip" too frequently will find a lowered accident rate, a better spirit of morale and a higher efficiency rating in his department.

And so the problem is one of human beings and not machines. It is one requiring intelligent inquiry, sympathy and understanding of the problems of the individual. It demands the highest type of leadership.

Continental Offers Stock

Stockholders of the Texon Oil & Land Company, discoverer of the Big Lake field, first major strike in West Texas, and a subsidiary of the Continental Oil Company, have been offered 1 share of Continental for 4 shares of Texon. This offer stands until February 7, with Continental reserving the right to extend the period. Texon has production in Kansas, Oklahoma and Texas, and is the holding company for Group 1 Oil Corporation, which has production in the Big Lake field and operates jointly with the Continental in the Howard-Glasscock district and other areas in West Texas.

Fields Defined

The Geological Survey has announced the definitions of the structures of four oil fields for the purposes of the Mineral Leasing Act, three of them revisions of previous definitions and one of a newly discovered field.

The areas outlined were the Belgian Anticline Field, California, covering 2435 acres as of November 14 last, and revisions of the McKittrick field, California, to 3404 acres as of the same date; the Russell field, New Mexico, to 1480 acres as of November 27, and the Musrat field, Wyoming, to 1705 acres as of November 14.

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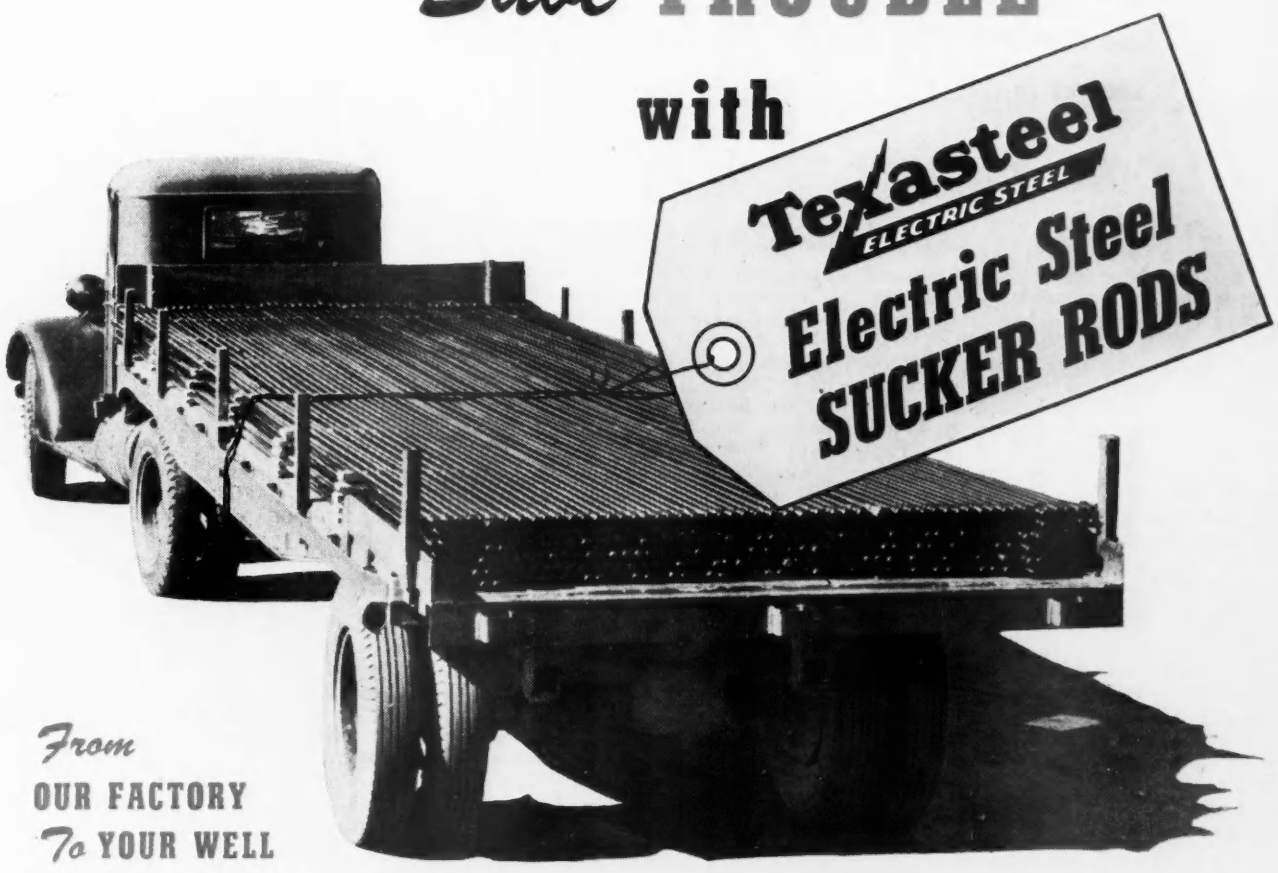

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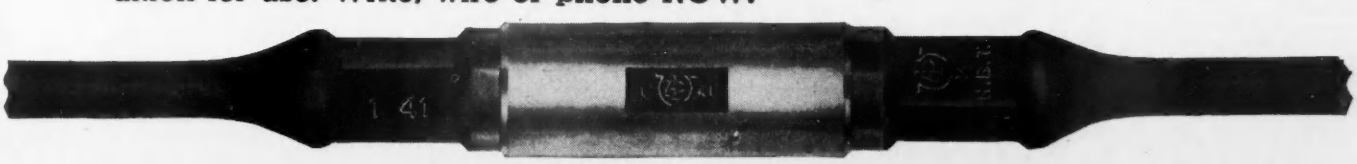
Truck Delivery overnight to the oil fields in the mid-continent area means you get Texasteel Rods promptly. ***One handling*** of the rods, shipped on specially built trucks with solid 26-foot beds and protected with soft wooden spacers, brings these rods direct from our plant to your lease in perfect condition for use. Write, wire or phone NOW.



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U. S. Crude Reserves

Approximately 81.5 percent of proved crude reserves in the U. S. is held by 32 companies

APPROXIMATELY 81.5 percent of the proved crude reserves in the U. S. is held by 32 companies. This is indicated by a tabulation prepared by THE OIL WEEKLY from data in a booklet recently published by Merril, Lynch, Pierce, Fenner and Beane, investment brokers. Along with much other data on the oil industry and individual oil companies, this booklet, entitled "Petroleum, 1946," included figures on crude reserves. Figures were from the oil companies in some cases, but were estimates in others.

These indicated domestic reserves for 32 companies totaled 16,979,400,000 barrels at the end of 1945. This amount represented 81.5 percent of the 20,826,813,000 barrels of total reserves in the U. S. at that time, as reported by The American Petroleum Institute.

Largest holder of domestic reserves is Standard Oil Company (N. J.), with estimated U. S. reserves of 3.5 billion barrels. Presumably, this figure included the estimate of 2.6 billion barrels credited to Humble Oil & Refining Company, about 70 percent of Humble stock being owned by Standard Oil Company (New Jersey). Humble itself is the largest owner of domestic reserves with the exception of the parent company.

Besides these leaders, four other companies have estimated domestic reserves in excess of 1 billion barrels each, as follows: The Texas Company, 1.5 billion; Standard Oil Company of California, 1.3 billion; Gulf Oil Corporation, 1.2 billion; and Socony-Vacuum Oil Company 1.149 billion.

Companies with domestic reserves of 500 million to 1 billion barrels include Standard Oil Company (Indiana), Shell Union Oil Corporation, Sun Oil Company, Phillips Petroleum Company, Sinclair Oil Corporation, The Ohio Oil Company, and Continental Oil Company.

Companies with domestic reserves of 100 million to 500 million barrels include: Amerada Petroleum Corporation, The Atlantic Refining Company, Barnsdall Oil Company, Cities Service Company, Mid-Continent Petroleum Corporation, The Pure Oil Company, Richfield Oil Corporation, Seaboard Oil Company of Delaware, Skelly Oil Corporation, Sunray Oil Corporation, and The Superior Oil Company. Domestic reserves less than 100 million barrels are credited to Lion Oil Company, Louisiana Land & Exploration Company, Plymouth Oil Company, Shamrock Oil & Gas Corporation, Standard Oil Company (Ohio), Texas Gulf Producing Company, and Texas Pacific Coal & Oil Company.

Foreign Reserves

Among these companies are several with large foreign reserves in addition to domestic reserves. However, data on foreign reserves are incomplete, not being shown for some important operators, such as Standard Oil Company of California and the Shell interests.

Among the companies listed, there are five which hold 15,470,000,000 barrels of estimated foreign reserves. It is noteworthy that this figure is nearly as great as the 16,979,400,000 barrels of domestic reserves of 32 companies, as previously cited. These five companies and their estimated reserves include: Standard Oil Company (New Jersey) 5.5 billion barrels; Gulf Oil Corporation, 5.3 billion; The Texas Company, 3.65 billion; Socony-Vacuum, 900 million; and Sinclair Oil Corporation, 120 million. Although Standard Oil Company of California's foreign reserves are not shown, that company ranks among the leaders with vast holdings in the Middle East. Not included in the above total of foreign reserves are the 3.6 billion barrels credited to Creole Petroleum Corporation. This company is 93 percent owned by Standard Oil Company (New Jersey), and operations are almost entirely in Venezuela. The five companies, Gulf, Sinclair, Socony-Vacuum, Standard (New Jersey), and The Texas Company, account for 40 percent of the estimated total of all reserves outside the U. S.

The previously mentioned 32 companies, including the five with tabulated reserves abroad, have a total of domestic and foreign reserves amounting to 32,449,400,000 barrels. This is about 55 percent of the estimated total world reserves of 58,911,813,000 barrels.

Estimated Domestic Crude Oil Reserves of U. S. Companies at End of 1945

COMPANY	BARRELS		
	Domestic Reserves	Foreign Reserves	Total Reserves
Amerada Petroleum Corporation	380,000,000		380,000,000
Atlantic Refining Company	325,000,000		325,000,000
Barnsdall Oil Company	200,000,000		200,000,000
Cities Service Company	370,000,000		370,000,000
Continental Oil Company	500,000,000		500,000,000
Creole Petroleum Corporation		3,600,000,000	3,600,000,000
Gulf Oil Corporation	1,200,000,000	5,300,000,000	6,500,000,000
Venezuela		800,000,000	
Kuwait		4,500,000,000	
Humble Oil & Refining Company	2,600,000,000		2,600,000,000
Lion Oil Company	36,400,000		36,400,000
Louisiana Land & Exploration Co., The	35,000,000		35,000,000
Mid-Continent Petroleum Corporation	150,000,000		150,000,000
Ohio Oil Company, The	550,000,000		550,000,000
Phillips Petroleum Company	575,000,000		575,000,000
Plymouth Oil Company	80,000,000		80,000,000
Pure Oil Company	450,000,000		450,000,000
Richfield Oil Corporation	220,000,000		220,000,000
Seaboard Oil Co., of Deleware	160,000,000		160,000,000
Shamrock Oil & Gas Corporation, The	2,200,000		2,200,000
Shell Union Oil Corporation	746,000,000		746,000,000
Sinclair Oil Corporation	550,000,000	120,000,000	670,000,000
Venezuela		120,000,000	
Skelly Oil Corporation	190,000,000		190,000,000
Socony-Vacuum Oil Company	1,149,000,000	900,000,000	2,049,000,000
Columbia & Venezuela		150,000,000	
Near East		750,000,000	
Standard Oil Company of California	1,300,000,000		1,300,000,000
Standard Oil Company (Indiana)	875,000,000		875,000,000
Standard Oil Company (New Jersey)	3,500,000,000	5,500,000,000	9,000,000,000
South America		4,500,000,000	
Middle East & East Indies		1,000,000,000	
Standard Oil Company (Ohio)	70,000,000		70,000,000
Sun Oil Company	615,000,000		615,000,000
Sunray Oil Corporation	195,000,000		195,000,000
Superior Oil Company	168,000,000		168,000,000
Texas Gulf Producing Company	46,000,000		46,000,000
Texas Pacific Coal & Oil Company	65,000,000		65,000,000
The Texas Company	1,500,000,000	3,650,000,000	5,150,000,000
South America		150,000,000	
Middle East		3,500,000,000	
Tide Water Associated Oil Company	393,700,000		393,700,000
Union Oil Company of California	383,100,000		383,100,000
Total Above Companies	*16,979,400,000	*15,470,000,000	*32,449,400,000
Percent of Reserves	81.5	40.6	55.1
Other Companies	3,847,413,000	22,615,000,000	26,462,413,000
Percent of Reserves	18.5	59.4	44.9
All Companies	20,826,813,000	38,085,000,000	58,911,813,000

* Totals include Standard Oil Company (New Jersey), and therefore, exclude that company's subsidiaries, Humble Oil & Refining Company and Creole Petroleum Corporation.

Baash-Ross News

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OUR 26th YEAR

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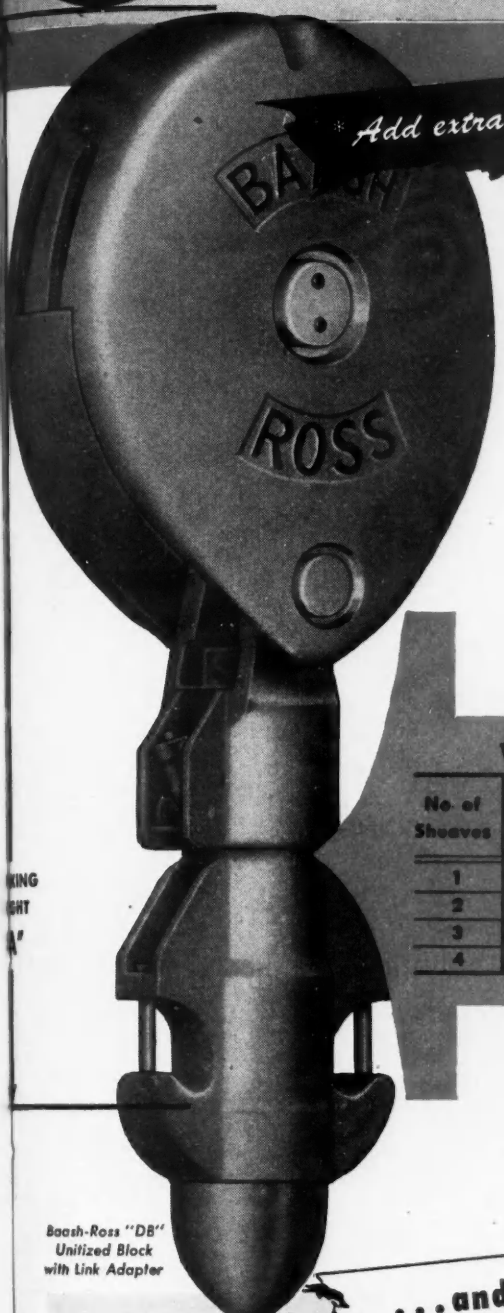

Baash-Ross "DB" Unitized Block with Link Adapter

Compare the multiple advantages of BAASH-ROSS DB UNITIZED BLOCKS with any other block and connector arrangement!

ON SPACE SAVINGS ALONE Baash-Ross Unitized Blocks represent a far-reaching advancement in portable rig equipment, For these Blocks combine in ONE rugged, compact unit *both* the traveling block and the hook or connector for supporting the drill string.

WORKING HEIGHT "A"

No. of Sheaves	SHEAVE DIAMETERS 20"	24"	30"	36"
1	50"	54"	60"	—
2	58"	62"	68"	—
3	63"	67"	73"	—
4	—	—	76"	82"

In the table at left are shown overall measurements for typical sizes of Baash-Ross Unitized Blocks. *Compare these dimensions with any other block and hook arrangement of comparable capacity.* Only then will you see how important are the space savings made by Baash-Ross Unitized Blocks—savings that actually add *extra feet* to the working height of your portable rigs. By adding more working room to your portable derricks, many vital savings are made...

FASTER TRIPS Risk of hitting crown is reduced, permitting faster operations, quicker round trips, more time on bottom.

GREATER SAFETY Increased working space means greater safety for both crew and equipment, fewer accidents, lower drilling costs.

LONGER PIPE Often the space saving of Unitized Blocks permit using longer pipe lengths, further speeding operations, saving time.

...and these advantages, too!

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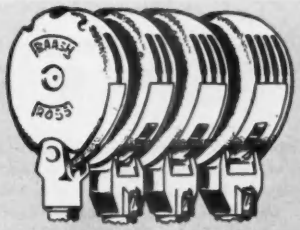
By eliminating extra elements in the hook-up, Baash-Ross Unitized Blocks are not only more compact, but also more streamlined than other arrangements. Nothing to catch in girts or rigging means still greater safety to crew and equipment, faster round trips and peak operating efficiency at all times.

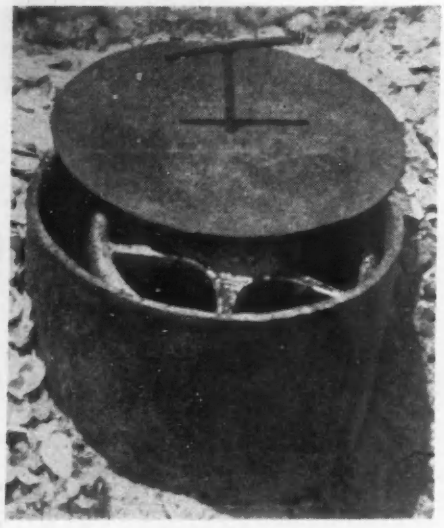
CHOICE of TWO TYPES
Baash-Ross DB Unitized Blocks are available in two basic types—either with Hook (left) or with Link Adapter Unit (large illustration). Both styles are free-swiveling . . . or can be instantly locked in any one of 8 different positions. Also, both are spring loaded. Link Adapter unit is recommended for maximum capacity and simplicity.



CHOICE OF 11 SIZES
Not only are there two basic types of DB Blocks, but each type is available in choice of 1, 2 or 3 sheave models with capacities of 30, 65 and 100 tons, respectively, and each in choice of 20", 24" or 30" sheave diameters . . . or in a 4 sheave model with 150 ton capacity and choice of 30" or 36" diameter sheaves. There's a size for every job—one for *your particular* requirements!

For more information see your nearby Baash-Ross representative. Or write direct.

Salvaged Pipe Affords Valve Stem Protection



$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

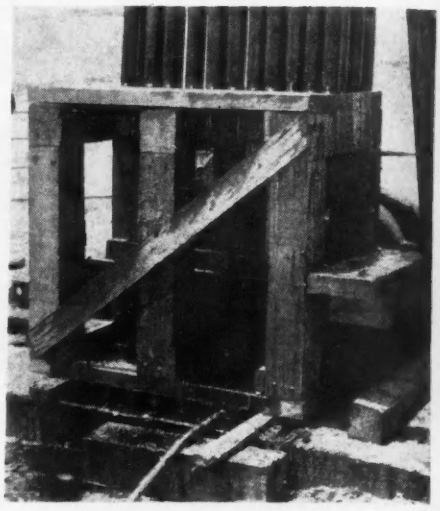
EQUIPMENT CARE

Maintenance of lease valves on gathering and trunk lines buried near the ground surface can become costly and time-consuming if not properly installed. The producing department of one company makes it a practice of protecting valves and valve stems located in lines buried at shallow depths. Illustrated is a typical example of such a method of protection.

When the line is installed, a short nipple of ten or 12-inch casing is fitted over the valve, the lower end of the nipple being slotted to fit around the pipe line. This short nipple is of sufficient length to extend slightly beyond the top of the valve stem, thus affording it protection and assuring free operation of the valve stem which might otherwise be lodged with rocks or hardened ground.

To further protect the valve stem from surface damage by trucks, cattle or negligent personnel, a top is fitted on the nipple with a small handle made from old reinforcing rods which permits the pumper to easily lift the lid from the device. The diameter of the lid is such that it fully covers the large nipple. Small lugs welded on the underside of the lid insure centering of that part and keeps it in place until intentionally removed in order to open or close the valve.

Tubing Stand Elevated

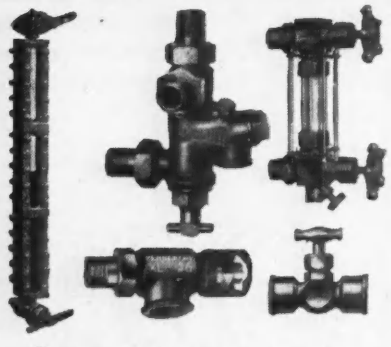


WELL SERVICING

In many areas, derricks are removed after the wells have been completed, subsequent well pulling being done with a portable rig. Such equipment usually has its own elevated flooring on which the men stand while working around the well head. The problem of stacking tubing with such an arrangement, having the stands on a level with the work platform, may be solved by providing a sturdily-built, elevated stand similar to that shown.

The pulling unit has been taken away, leaving the mast, with tubing left standing on the special support. The rack is made of heavy 8 x 8-inch timbers braced and spiked together. Three-inch planking on the top and a step arrangement on the front side complete the simple support.

PENBERTHY
QUALITY
PRODUCTS



Penberthy liquid level gages of various types—injectors—ejectors—all so widely used throughout the oil industry because they have always been dependable under the most severe service conditions.

All are of rugged construction and made by an organization with 57 years experience in the manufacture of quality products.

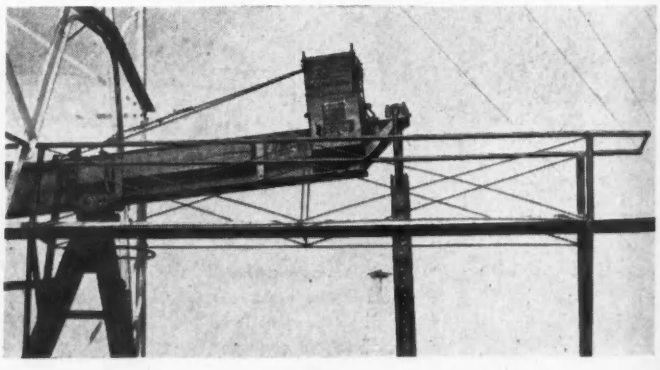
See Pages 3126 to 3131 Composite Catalog

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

Walking Beam Counter-Weight Supported By Cable

COUNTER-BALANCING

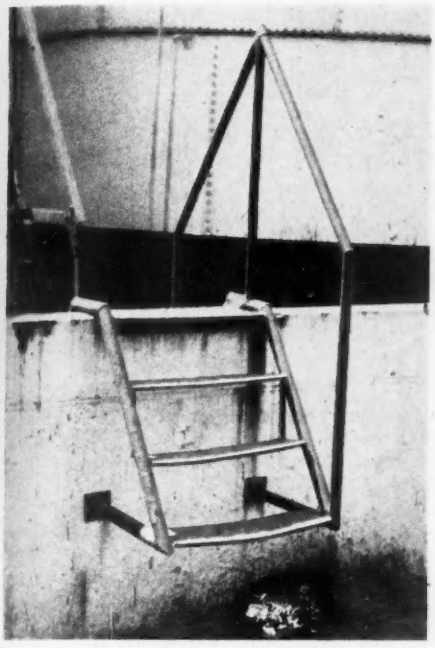
On a long-stroke pumping unit, the angle at which the counterweight is canted at each end of the stroke introduces a force which tends to rock the counterweight on its base, and thus stresses the set screws which are used to locate the assembly at the point of proper balance. Creeping then takes place, or the weight, becoming loosened, pounds against the beam and adds to the bearing load and to the stresses carried by the rod string.



One company passes a bight of sand line over the counterweight, anchoring one end at the heel of the pitman bearing box, and carrying the other forward to a hitch ahead of the fulcrum. A turnbuckle in one side of the line permits tension to be varied as desired, the wire being tightened until the rocking tendency of the counterweight is eliminated. If the tie-down wire tends to shift along the counterweight, or the weight works forward under the line, placing a pair of wire line clamps at the edges of the weight blocks will check the shifting and further aid in stabilizing the weights under high-speed, long stroke pumping.

PRODUCTION HINTS

Removable Fire-Wall Ladder Eliminates Congestion



LEASE SAFEGUARDS

Conforming with ordinances pertaining to adequate retaining walls surrounding oil tank batteries is difficult in town-lot areas, where every foot of space is needed for the well equipment. One operator, having his retaining wall close to the alley line, which left little space for adequate steps or ladder, devised a movable four-step ladder which can be shifted when work or hauling on the lease makes it desirable to have maximum space between the lease structures.

Composed largely of salvaged materials, the ladder is easily made by a welder, and is so constructed that it will hang over the wall. Short horizontal legs resting against the wall on each side give the ladder stability. The pipe hand rail along one side provides a degree of safety for workmen using the small ladder, and the whole unit is light enough to be easily lifted by two men.

Shop-Made Supporting Device Confines Movement Of Well Pull Lines To Contour Of Ground

PULL RODS

Simplicity of design, long-lived service, and economy of construction are the outstanding features of a practical type of pull cable support devised by the superintendent of one oil company. The device consists of two short parallel bars of sucker rod material welded vertically to the upper end of the two-inch pipe post forming the support. A bolt spanning the space between, and at the top of the rods, forms the axle for an oversized cylindrical bearing to which is welded an automotive piston rod. In sandwich fashion, the cable is clamped between two short pieces of spring leaf steel, bolts being run through the two pieces as shown.

Chief advantage of this type of installation is the fact that lubrication is not essential for the loose-fitting bearing. The slow, relatively short strokes impose little wear on the sleeve, and a number of years service may be expected without attention. Such a support is ideal for use at points where the cable spans a depression in the terrain and which requires a single high leg that will confine the motion as well as prevent undesirable sag in the line.

The expense involved in fabricating such a support is negligible compared to the return in trouble-free service.

INCREASE PRODUCTION
Clean Out with a

MILLER Sand Pump

A Quarter of a Century with thousands and thousands in satisfactory use prove its World-Wide popularity.

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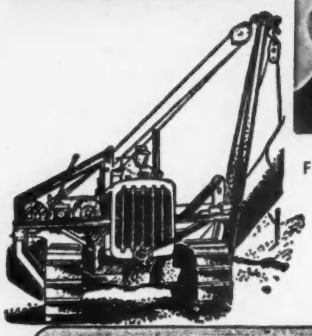

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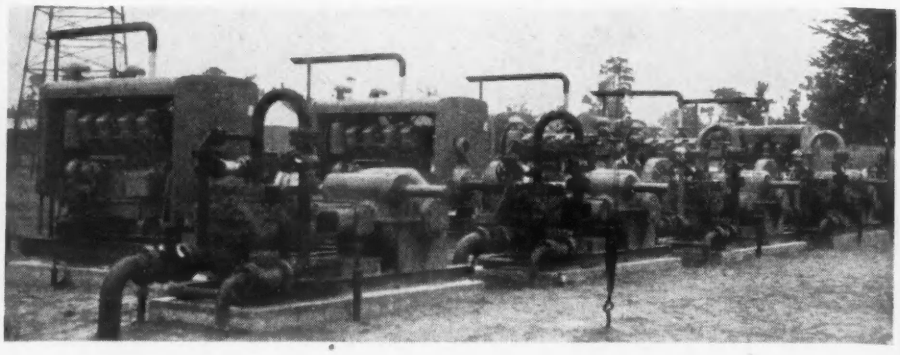
Exposed Check Valves Ease Station Maintenance



PUMPING STATIONS

Crude from field gathering lines can be depended upon to clog check valves and orifices unless facilities are installed to clean these points favorable to the accumulation of entrained foreign material and paraffin. One East Texas operator taking crude from gathering lines and stepping up pressures before putting the oil into trunk lines utilizes two check valves on each pump.

One valve is placed in the intake line and one in the discharge line of each pump. This method of installation makes each unit independent of the other so that repairs or breakdowns on one unit will not interfere with the normal operation of the other. This system of installation is illustrated in the pumping station shown.

Both check valves are located above ground, providing adequate working space when the need arises for cleaning each valve. Each unit has been properly bypassed so that fluid gathered from the field may be directly connected to the line through both check valves. Each pumping unit is placed on its own foundation, eliminating vibrational stresses from one unit to the other. All units have also been centralized to minimize maintenance.

Fabricated Tee Support Confines Expansion Of Surface-Laid Pipe Lines To Predetermined Areas

PIPE LINE EXPANSION

A method of confining expanding pipe line loops to a predetermined and restricted area of travel is contained in the installation shown. The surface-laid line, subjected to considerable expansion under extremes of a hot daytime sun and chill night temperatures, was provided with a broad loop which rests upon a T-shape support made of salvaged pipe.

Supported at three points, the pipe ordinarily would be free to expand at any point, but with this system, expansion is divided equally along both sides of the loop. At the point where the line rests atop the vertical portion of the support, a round steel bar was looped over the line and welded to the support on either side. On the bottom and on either side of the supporting pipe was welded a triangular clip which restricts lateral movement at that point to one inch or less. With posts set in concrete to lend rigidity, the installation has yielded good results in controlling unequal expansion of lease pipe line loops.

Attention! Production Crews!

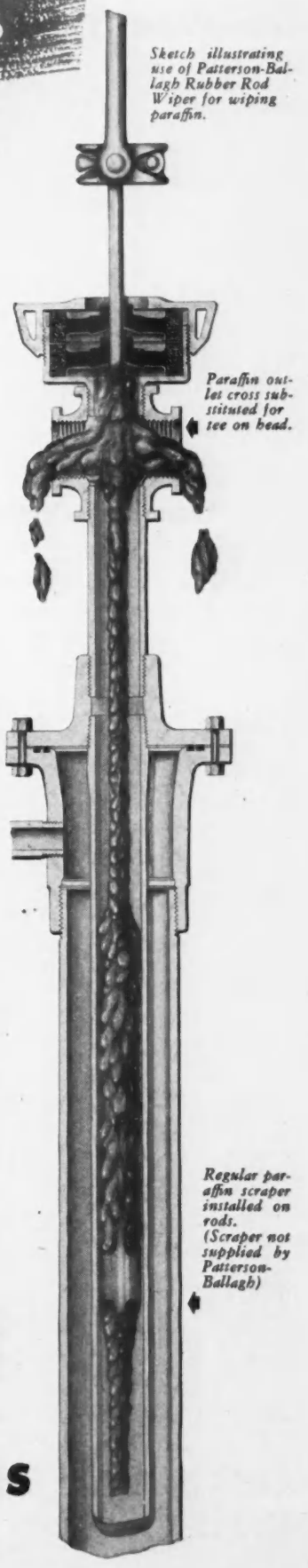
HERE'S MORE HELP FROM PATTERSON-BALLAGH'S SUCKER ROD WIPERS

Patterson-Ballagh's SUCKER ROD WIPER Code: SUBZONE Duo-Wipe Style

✓WIPES RODS CLEAN

✓WIPES PARAFFIN

✓DIVERTS GAS FLOW



Sketch illustrating use of Patterson-Ballagh Rubber Rod Wiper for wiping paraffin.

Paraffin outlet cross substituted for tee on head.

Regular paraffin scraper installed on rods. (Scraper not supplied by Patterson-Ballagh)

Use as a paraffin wiper makes jobs easier and cleaner

The industry's long felt need for a practical wiper to efficiently wipe sucker rods in the thousands of wells where paraffin coats both rods and tubing, is now filled. Patterson-Ballagh's SUBZONE, used as shown in the sketch, makes the operation simple. The TEE at the pumping head is replaced with a CROSS. As the couplings, rods, and the paraffin scrapers pass the CROSS, the wiped off paraffin is forced out the outlets of the CROSS. This excess paraffin can be piped off to the sump through a 4″ pipe, if desired.

Protective use of SUBZONE in gas fields

Refill Rubbers Code: PRAETOR

The sealed feature of the SUBZONE, when the lid is screwed down tightly on the body, makes it adaptable for use where poison gas is piped off the head during the rod pulling job. The method used is similar to the paraffin wiping operation, except the pumping TEE is not removed and the gas is piped off the head during the rod pulling job through the side outlet of the TEE.

For complete information on all Patterson-Ballagh Sucker Rod Wipers, Refill Rubbers and Accessories, send for Folder No. 310 and ask your Patterson-Ballagh Field man for additional information. Write for *your free copy* of the 1947 General Catalog for other helpful production ideas.

Specify **PATTERSON-BALLAGH**

DIVISION OF BYRON JACKSON CO.

"Best Bet Yet!"

SUCKER ROD WIPERS

Main Office: 1900 E. 65th St. Los Angeles 1 ★ 6247 Navigation Blvd. Houston 11 ★ 808 Graybar Bldg. New York 17 ★ 931 Russ Bldg. San Francisco 4

MARKET TRENDS

Oil Products, Crude Output Down; Gasoline Stocks Top Previous Week

Decreases in the output of all oil products as well as a decline in crude production were noted in the weekly bulletin of The American Petroleum Institute for the week ending January 11.

With the exception of gasoline inventories, all product stocks and crude stocks were off compared with the previous week.

Crude production averaged 4,531,000 barrels daily during the week, a decrease of 118,000 barrels from the week before and averaging about the same as a year ago. Runs to refinery stills were down 139,000 barrels daily to an average of 4,778,000 barrels. Crude stocks totaled 223,291,000 barrels on January 4, the Bureau of Mines reported, a drop of 2,704,000 barrels over December 28, 1946.

Gasoline output during the week totaled 14,928,000 barrels, a decrease of 353,000 barrels from the previous week but still 9.4 percent greater than the comparable week of a year ago. However, gasoline stocks rose 1,665,000 barrels during the week to 96,547,000 barrels. Total gasoline stocks now are 3.3 percent under the 99,882,000 barrels in inventory on January 12, 1946.

Gas-oil and distillate output totaled 5,820,000 barrels during the week, a decline of 37,000 barrels from the previous week, while residual fuel production was 7,801,000 barrels, a drop of 574,000 barrels in a week.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1943	4,486	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	47,187	11-27	72,881	1- 2
1944	4,762	9-30	4,798	12-30	240,992	1- 1	89,162	4- 1	48,162	10-28	64,744	10- 7
1945	4,944	7-21	[1]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	[1]4,961	6-15	4,968	12-28	229,430	3- 2	105,233	2-16	[1]67,286	11- 9	61,636	11- 2
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 3
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,382	4-12	90,914	7-13
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-18	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,228	2-12	220,258	9- 9	76,302	1- 1	30,232	4-19	49,737	3-18
1945	3,621	10- 6	3,409	10-6	[4]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3- 9	4,498	1-12	218,193	1- 5	85,324	9-28	25,131	3- 9	37,289	4- 6

TRENDS OF 1946 AND 1947

Trends in Week Ended	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,293	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,327	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,312	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,447
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 28	4,778	4,829	223,043	14,675	85,324	5,632	59,827	8,172	57,657
October 26	4,730	4,758	221,184	14,863	86,423	5,710	65,499	7,728	60,872
November 30	4,795	4,707	227,693	15,145	88,471	5,258	66,062	7,672	58,647
December 28	4,713	4,968	225,995	15,604	93,126	5,931	58,941	8,181	53,427
1947:									
January 4	4,649	4,917	223,291	15,281	94,882	5,857	58,034	8,375	53,285
January 11, 1947	4,531	4,778	.....	14,928	96,547	5,820	54,788	7,801	51,423
January 12, 1946	4,571	4,449	[5]218,193	13,640	99,882	5,380	33,246	8,369	38,256
Change:									
In Week	—118	—139	—2,704	—353	+1,665	—37	—3,246	—574	—1,862
In Year	—40	+329	+5,098	+1,288	—3,335	+440	+21,542	—568	+13,167
In Year	—0.9%	+7.4%	+2.3%	+9.4%	—3.3%	+8.2%	+64.8%	—6.8%	+34.4%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, January 45, 1946.

Demand Strong for Products; Prices Generally Unchanged

A strong demand for all petroleum products, especially gasoline, was noted last week throughout the nation with a few refiners in some area of the country becoming "buyers" instead of "sellers."

Prices for No. 2 fuel on the Atlantic Coast broke slightly while quotations for other products over the nation remained generally unchanged.

Several independent refiners in the Central Michigan region were feeling a crude shortage which has created a serious shortage of fuel oils. In some sectors of the region only emergency consumers were being supplied. Gasoline inevntories were also reported low for this time of year and meeting next season's gasoline demand may develop into a problem.

Export demand for lubes and some other products in Western Pennsylvania remained heavy while demand for gasoline continued strong.

A reduction of 0.1-cent in tank wagon prices for No. 2 fuel at Northern New Jersey points was posted by Standard Oil Company of New Jersey, effective January 13. The new posting is 8.6-cents. Other points in New Jersey were not affected.

Socony-Vacuum Oil Company announced a reduction of 0.2-cent in its prices for No. 2 fuel, all methods of deliveries, at several points in Connecticut. Socony's new price is 6.5-cents. At New Haven, the Atlantic Refining Company lowered its yard and tank car price for No. 2 fuel from 6.7-cents to 6.25 cents and for kerosine from 7.3 cents to 7 cents.

A reduction in prices for No. 2 fuel to 6.25 cents tank cars, and 6.15 cents barges was reported by some suppliers in New York harbor. Although gasoline was tight at New York harbor, quotations continued unchanged. Prices for regular grade fuel in tank car lots ranged from 8.05 cents to 9.3 cents.

The sale of a 50,000-barrel cargo of Bunker "C" fuel at $1.48 was reported by one Gulf Coast supplier last week. Further reports indicated that no cargo offerings were available at $1.38. Inquiries for lower octane gasoline continued.

Midwest suppliers reported an increase in consumer demand for gasoline after bad driving conditions around the first of the year had halted most traffic.

One car of Grade 26-70 natural gasoline was reported sold last week at 5 cents, FOB Group 3. No spot sales were reported FOB Breckenridge.

Scouts Name Officers

The Rocky Mountain Oil Scouts Association elected the following officers: S. A. (Stew) McChesney, Phillips Petroleum Company, president; C. MacKinnon, Stanolind Oil & Gas Company, vice president; William Finch, Shell Oil Company, secretary-treasurer; Elmo Moore, Pacific Western Oil Company, chief of Scouts Yearbook.

Michigan Leases Offered

The Lands Division, Michigan Department of Conservation, will offer at auction January 31 in Lansing more than 20,000 acres of state land for oil and gas lease, Carl Wender, head of the division, announced. The entire offering is listed as wildcat.

☆ Oklahoma

Wetumka Discovery Estimated Good for 1000 Barrels Daily

New discovery near Wetumka estimated good for 1000 barrels daily; gasser opens field in Oklahoma County; deep Hunton production opened in McClain area; Garvin County wildcat opens oil pool; Panhandle gets new gas field; old dry hole flows oil while crew pulls pipe; distillate pool opened by well formerly abandoned as dry; Bigham field well credited with finding first oil in 1947.

Hughes County: A wildcat that may prove to be among Oklahoma's best discoveries of 1947 has opened an oil field 5 miles east of Wetumka, and tests indicate its production may be from 1000 to 1200 barrels daily. The test, Texola Drilling Company and E. K. Carey Drilling Company's Meadors 1, NE NE NW 31-9n-11e, started off at the rate of 40 barrels of 39.7-gravity oil an hour from the Cromwell sand, 3090-3110 feet. At the end of 3 days the well was still flowing at the rate of 25 barrels of oil per hour. It is in the Greater Seminole Area, a region that previously had been drilled to the Wilcox. The strike is indicative of work to continue through the year in these old "played-out" areas. The Seminole area contributed greatly to Oklahoma's oil production and exploratory completions during 1946. Production may be increased in Meadors 1 when tubing is pulled so that mud and debris logged around bottom of the tubing can be released. Gas was in excess of 1½ million cubic feet per day during initial tests. Otha H. Grimes has staked an offset directly north of the well, the test being Crawford 1, SE SE SW 30-9n-11e. Texola-Carey will start soon at 2 new locations on the Meadors lease. They are Meadors 2, NW NE NW Sect. 31, and Meadors 3, SE NE NW of Sect. 31.

Oklahoma County: Peppers Refining Company and Ace Gutowsky have opened a gas field with Martin 1, CSW NE 20-13n-2w, near Witcher, southeast of Edmond townsite. The well tested an estimated 10 million cubic feet on 1½-hour test from the Bartlesville sand, 6064-85 feet. The formation has not yet been shot, the well having been shut in for connections after the initial flow. Peppers has applied to Oklahoma Corporation Commission for 160-acre well-spacing around the discovery. Hearing has been set for January 21 in Oklahoma City.

McClain County: Deep Hunton production has been opened by R. L. Bauman and Max Pray with Ainsworth 1, CNW SE 26-5n-4w, outpost southeast of the North Lindsay pool, which produces from the Bromide. The Ainsworth made 40 barrels of oil per hour on 1-inch choke from Hunton through perforations at 9892-940 feet. On a 24-hour test the well flowed 820 barrels of oil. Total depth is 10,997 feet where water was encountered in the Bromide.

Garvin County: A new oil field has been opened by McElreath & Suggett, Inc., independent operators of Fort Worth, east of the East Antioch field. Tolbert 1, SE SE NW 14-3n-1w, west of Pauls Valley townsite, swabbed at the rate of 10 barrels of 41-gravity oil per hour following acid treatment from 4140-52 feet. There has been some conflict in opinion as to whether the pay is from a detrital zone in base of the Pennsylvanian, or a sand in top of the Bromide zone. The wildcat was taken to 4335 feet in Bromide.

Beaver County: A new gas field apparently is being opened in the Oklahoma Panhandle by H. L. Hunt's Light 1, CSE SE 9-6n-21eCm. The test, located about 10 miles southeast of Liberal, Kansas, is making an estimated 50 million cubic feet of gas from the Mississippi lime at 6630-38 feet, with about 30 barrels of distillate a day. The well is now shut in for connections and further testing. The test is about 5 or 6 miles east of production in the 3-state Hugoton gas field, but deepest production in the Guymon sector of the Hugoton field is 3000 feet.

Seminole County: Barnsdall Oil Company's Dickie Johnson 3, SW SE SE 17-6n-6e, northwest edge of the Konawa field, long considered by the company to be an exhausted oil and gas well, flowed 217 barrels of oil in 24 hours through perforations in the Thurman sand at 2600-15 feet while crew was pulling pipe for salvage. The well was listed as a dry hole for several years, after having depleted itself of production from the Cromwell sand from 2902-10 feet. When it started flowing, the well made 97 barrels of oil on choke in 17 hours, and will be completed from the Thurman zone. As a result, the company will check thoroughly all data before plugging any old well which might have been drilled too rapidly from 1926-1936, and which might prove to have shallower production.

Antioch Area: Completion tests have been run on The Carter Oil Company et al's Hart 1, SE SE SE 23-3n-3w, Garvin County, which prove the well has opened a new distillate pool less than 2 miles west of production in the Southwest Antioch field. The Hart, taken over by Carter and associates in November after it was abandoned by Mid-Continent Petroleum Corporation, is flowing at the rate of 20 barrels of 59.5-gravity distillate every nine hours through ½-inch choke, with 1,380,000 cubic feet of gas daily. Gas-oil ratio is 22,900/1, with tubing pressure 325 pounds and casing pressure 400 pounds. Production is from perforations at 7206-21 feet.

Okfuskee County: The first well to find oil in Oklahoma in 1947 was a test in the new Bigham field, southeast of Okemah. Ralph Fillmore's Palmer-Barnett 1, NW SW NE 34-11n-10e, is testing 35 barrels of oil from the Cromwell sand, 3310-38 feet, with 1,100,000 cubic feet of gas per day. It was the first test to get oil in the state in 1947.

Wells Completed in United States in Week Ended January 11, 1947

Data preliminary and subject to revision. Revised and more complete data on all completions and exploration shown in monthly summaries published in last issue of each month.

State or District	FIELD COMPLETIONS: New Wells Oil	Dist.	Gas	*Input	Dry	Total	Old Wells Deepened	EXPLORATORY COMPLETIONS Oil	Dist.	Gas	Dry	Total	ALL COMPLETIONS This Week	Last Week	This Week 1946
Alabama														1	
Arkansas	2				2	4					1	1	5	9	1
California	30				2	32	3				6	6	41	33	41
Colorado	3					3							3	5	3
Florida											2	2	2		1
Illinois	49				23	72	1	6			23	29	102	37	79
Indiana	10				4	14							14	29	18
Kansas	30		16	1	12	59	2	1			13	14	75	45	53
Kentucky	6				5	11							11	15	38
Louisiana*	18	2	2		9	31					13	13	44	19	27
N. Louisiana	12	2	1		6	21					9	9	30	9	15
S. Louisiana	6		1		3	10					4	4	14	10	12
Michigan			4		4	8					6	6	14	17	14
Mississippi	2					2					1	1	3	11	4
Montana	2					2					2	2	4	1	19
New Mexico	6		1		3	10	3	1			2	3	16	13	6
New York	15		2	10		27							27	26	25
Ohio	6		8		9	23							23	25	20
Oklahoma	45		7	1	36	89	4				10	10	103	71	37
Pennsylvania	27		1	15	1	44	1						45	48	42
Texas	101	1	6		17	125	3	5	1	1	19	26	154	151	159
E. Tex. Bor. Co.'s	1				1	2							2	7	2
Rest of E. Tex.	6					6					3	3	9	11	8
North Texas	27				6	33					4	4	37	35	73
W. Central Tex.	2				1	3					2	2	5	24	8
West Texas	36				1	37	1	1			1	2	40	24	23
Texas Panhandle	1		4			5							5	14	7
G. Coast, Upper	9	1			3	13					1	1	14	6	11
G. Coast, Lower	12		1		3	16	1	2	1	1	1	5	22	20	20
Southwest Texas	4		1		2	7	1	1			6	7	15	8	2
S. Central Tex.	3					3		1			1	2	5	2	5
West Virginia			2		1	3	1						4	17	13
Wyoming	4				1	5					2	2	7	1	3
Total U. S.	356	3	49	27	129	564	18	13	1	1	100	115	697	574	604

* Includes salt water disposal wells.

☆ Kansas

Barton County Wildcat Shows 1200 Feet of Oil on Test

Barton County wildcat shows 1200 feet of oil on test; 2 Hugoton field gassers completed in Kearny County for flow of 20 million cubic feet; prospective pool opener testing in Mississippi lime.

Barton County: Indications of a new oil pool 2½ miles southeast of the Pawnee Rock pool are apparent at Bay Petroleum Company et al's Houdyshell 1, NE SE SW 31-20s-15w. On a drill-stem test taken at 3844-50 feet in the Arbuckle lime, the wildcat showed 1230 feet of oil with no water. The Arbuckle was topped at 3785 feet, and testing in this formation is continuing. Conglomerate was topped at 3708 feet and Simpson sand at 3757 feet. The well has an elevation of 2013 feet, and is somewhat higher structurally than producing wells in the Pawnee Rock pool.

Kearny County: Development in the Hugoton Gas field is continuing at a rapid pace, and promises to increase during 1947. Two large gassers in the field were completed during the week for a total of 20 million cubic feet, with pay coming from shallow Permian sands prevalent in the area. Cities Service Oil Company's Sharp 1, center of 10-24s-35w, made a potential of 12,800,000 cubic feet per day, and the Campbell 1-B, center of 12- 23s-35w, was given a potential of 7,770,000 cubic feet daily. Three new locations for the field were announced by Cities Service, all of which are in Finney County, but in the Hugoton area.

Barber County: A new oil pool may be opened west of the Whelan pool by the J. M. Huber Corporation and associates. Smith 1, CEL NE NE 10-32s-12w, 3½ miles west of the Whelan pool, logged a good show of free oil from the Mississippi lime at 4279 feet, and after water was exhausted, bailed ½ barrel of oil per hour. Other perforations will be made in the formation, which will then be tested.

Missouri

A wildcat test for oil and gas in the Cameron area of Clinton County, Northwestern Missouri, will be drilled by William Peppas, St. Joseph, Mo., and associates. The land has been under lease since 1941, and is comprised of a block of 709 acres in 3 leases, being on both sides of the Burlington Railroad tracts in Sects. 28, 28 and 33-57n-30w.

The block is about 10 miles northwest of the Polo gas pool, owned by Skelly Oil Company, and about the same distance northeast of Plattsburg gas pool.

☆ New Mexico

Northeastern Lea County Wildcat to Make Pumper

Wildcat in northeastern Lea County to make pumper. Roosevelt County prospect to abandon.

Wildcats: Devonian Oil Company's Browne-Federal 1, C NW NW 19-9S-38E, isolated wildcat in northeastern Lea County, swabbed 30 barrels of oil daily after using 1500 gallons of acid in broken pay at 4926-5012 feet, and will reacidize before setting pump. This production is from the San Andres, topped at 4230 feet, with elevation 3969 feet. It is 12 miles northwest of the Landon pool, Cochran County sector of West Texas, nearest production.

The Texas Company's Garret 1, C NE SE 22-16S-38E. 1¼ miles northwest of a 10,085-foot Lea County wildcat failure, was drilling lime at 5040 feet in the San Andres.

Roosevelt County: Continental Oil Company and Cooperative Refineries Association's Alston-Federal Unit 1 was scheduled to abandon after failing to respond to acid at 4290 feet. This wildcat was plugged back from 5225 feet.

Hobbs Field: Sun Oil Company's McKinley 1-B, which passed up a small amount of oil in the Wolfcamp at 7542-7658 feet, was drilling hard gray lime at 7795 feet.

Amerada Petroleum Corporation's State 6-B, C SE NW 29-18s-38e, became the seventh producer for the Bowers sand in flowing 319 barrels of 42-gravity oil, with gas-oil ratio 1085/1, on 19½-hour gauge through ¼-inch and ½-inch chokes. This production is from pay at 3201-3209 feet, with the hole bottomed at 3219 feet. Rig has been skidded to drill State 3-A, 32-18s-38e.

Brunson Field: Amerada's Corrigan 6, north edge of the Ellenburger producing area, was making production test after acidizing perforations at 7508-30, 7545-90 and 7618-80 feet in Ellenburger, topped at 7508 feet. It was drilled to 7698 feet in granite, topped at 7687 feet. This well passed up flowing production from Simpson sand at 7453-73 feet.

☆ West Texas

Scurry County Ellenburger Test Confirms High Position

Scurry County Ellenburger prospect confirms high structural position with nominal shows. Pipe set for production test of isolated Hale County wildcat; official gauge given Silurian discovery in Dollar Hide field.

Scurry County: Humble Oil & Refining Company's Davis 1, C SW SW H&TC 339, Block 97, was attracting attention through having logged broken oil-saturated dolomite in Ellenburger, topped at 7915 feet, or 163 feet high to a failure 6 miles west by south. A drill-stem test at 7920-44 feet yielded only 35 feet of rotary mud, while a test at 7930-60 feet returned 60 feet of slightly oil-cut mud. The test was drilling at 7965 feet. The Mississippian was entered at 7780 feet, with elevation of 2413 feet, and a drill-stem test at 7785-7815 feet yielded 40 feet of slightly oil-cut mud. Humble controls the immediate area.

Hale County: Stanolind Oil & Gas Company's Fisher 1, E. L. & R. R. 5, Block CL, 19 miles east by north of production, was starting production test of broken oil pay in the Pennsylvanian at 6992 feet with open hole below 7-inch casing seat at 6890 feet. It is prepared to deepen to the Ellenburger if commercial producer is not obtained. A minor showing of water with green oil recovered when tester was used on bottom has since been classed as fresh water.

Crockett County: Stanolind's University 1-TT, C SW NW Sec. 12, Block 39, ½ mile north of its gas-distillate discovery, was drilling barren Ellenburger lime at 8245 feet, with the dolomite and possible oil zone due near this level. A prolific flow of gas-distillate was passed up at 8013-65 feet. Shell's University 1, 1½ miles southwest of the first test, was drilling shale at 7375 feet.

Midland County: Humble's Turner 1, 2 miles south by east of its Strawn discovery, will erect pump after swabbing 2 barrels of fluid hourly, including 3 percent basic sediment and water, after acidizing Wolfcamp perforations at 8500-65 feet. This outpost was plugged back from 11,445 feet in barren Devonian.

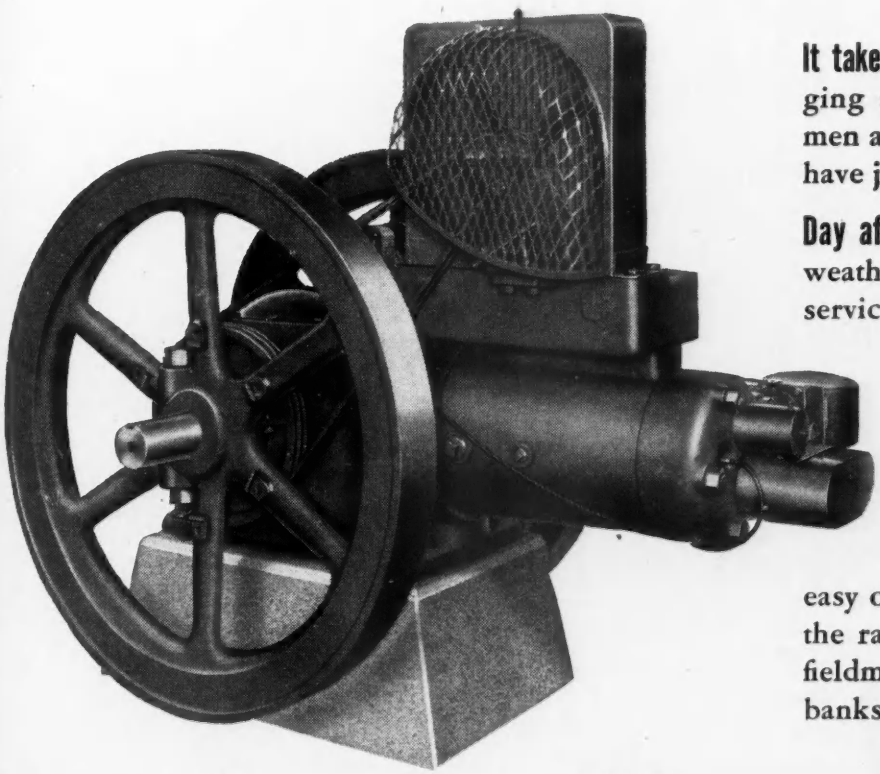
Wheeler Field: Lion Oil Company's TXL 1, a mile east of the most southerly producer, was abandoned at 8670 feet after testing water in the Devonian at 8623-70 feet. A drill-stem test at 8555-8640 feet showed promise of making a small pumper, but the crude yield per acre from such thin pay would not warrant the expense of setting pipe for completion. Sun Oil Company's Wheeler 2-A, north edge of the field and east offset to a dually-completed Devonian and Ellenburger well, cemented 5½-inch pipe on bottom at 9390 feet in dry Silurian to complete from Devonian perforations. Its low structural position resulted in cancellation of plans for a test of the Ellenburger.

Winkler County: Santa Fe Petroleum Company's Wheeler-Magnolia 1, C NW NW PSL 21, Block B-6, Ellenburger prospect, was drilling lime and shale at 10,010 feet in Silurian, topped at 9805 feet. This wildcat logged base of the Permian at 8090 feet, with elevation 2950 feet, and logged a nominal show of gas upon entering the Devonian at 9620 feet. Amon G. Carter et al's Wight-Gulf 1, C SW SW PSL 29, Block 40, and 2⅞ miles southeast, logged base of the Permian a foot lower, and was drilling chert and lime at 9165 feet on Ellenburger objective. The latter temporarily passed up probable oil production at 6673-6800 feet in the Tubb, topped at 6280 feet with elevation 2949 feet. Base of the Permian is remarkably flat in this general area, as Sinclair Prairie Oil Company's Campbell 1, Ellenburger failure, logged this marker at 8090 feet, with elevation of 2869 feet, while Hunt Oil Company's Hill 1, abandoned at 8821 feet, charted the base of the Permian at 8022 feet, with elevation of 2820 feet. Production from Ellenburger will be dependent upon the thinning of pre-Permian beds.

Kent County: Humble's Blair 1, C NW SW H&TC 44, Block, 5 and 1⅝ miles southwest of its Ellenburger discovery for the Polar 2-well field, entered the Ellenburger at 7805 feet, or 59 feet low. A drill-stem test at 7834-80 feet yielded 12 feet of rotary mud, while a test at 7880-7925 feet returned 6835 feet of sulphur water, giving the area 3 Ellenburger failures.

Andrews County: Magnolia Petroleum Company's Cowden 2-B, northeast offset to Devonian production in the Dollar Hide field and a failure in this zone, established deeper pay in flowing 535 barrels of 43.6-gravity oil, with gas-oil ratio 270/1, on natural potential through ¼-inch choke from open hole at 8345-65 feet in Silurian, topped at 8160 feet. It is currently the highest well in the field, having logged the Permian-Devonian contact at 7495 feet. The producing section of the Devonian is absent. Seven-inch pipe was cemented at 8345 feet, excluding some of the Silurian pay, but the large diameter pipe will permit deep-

STEADY PLUGGER!



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ening to the Ellenburger, which is likely to produce on the apex of the structure.

Humble's Pinson 1, ½-mile south of the Ellenburger discovery for the Nelson pool, cemented 5½-inch pipe at 10,585 feet to acidize nominal saturation and porosity in Ellenburger, topped at 10,647 feet, or 267 feet low. It is bottomed at 10,861 feet in granite, topped at 7495 feet.

Ector County: The Texas Company's Thomas 12, C SW SW T&P 6 and northwest outpost for the Devonian sector of the TXL field, flowed 253 barrels of oil natural on 7-hour test while conditioning well for official gauge. Production is from perforations at 7970-8055 feet in Devonian, topped at 7945 feet with elevation of 3348 feet. The structural position and pay thickness of this well indicates that Devonian pay will be expanded west and particularly northwest. Cities Service Oil Company's Thomas 4-C, 2 locations east, flowed 2780 barrels initial through ¾-inch choke after acidizing Ellenburger open hole at 9780-9835 feet.

Phillips Petroleum Company et al's Millard Unit 1, ¾ mile southwest of the Wolfcamp-pay pumping discovery awaiting gauge in the Murchison area, entered the Ellenburger at 10,787 feet, or 86 feet low, and was deepening from 10,934 feet, where it tested salty-sulphur water.

Stanolind Buys Lease

Stanolind Oil & Gas Company purchased the Stewart Oil Company's C. C. Giles nine-acre lease in the East Texas field for $250,000 cash, or $62,500 per well. This lease has four wells with an allowable of 80 barrels daily, and has been producing since May, 1931.

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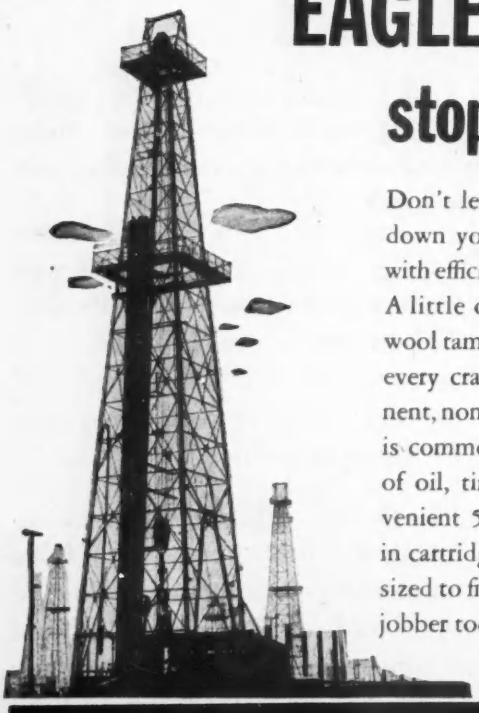

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☆ North Texas

Jack County Prospect Shows For Ellenburger Discovery

Semi-wildcat in Jack County shows for Ellenburger discovery. Collin County prospect passes up about 100 feet of broken Strawn pay.

Jack County: Warren Oil Corporation's Gillespie 1-C, J. B. McNeil Survey, A-1796, ¾-mile north of 3500-foot Strawn production and 2 miles southwest of the Ellis multi-pay field, was awaiting production test of open hole at 5480-5517 feet after indicating commercial yield from Ellenburger, topped at 5480 feet with elevation of 1091 feet. A drill-stem test of the zone yielded gas to the surface within 8 minutes, and the tool yielded 8 barrels of high-gravity oil and 3 barrels of oil-cut mud. Favorable showings were logged in the Bend and Mississippi, topped at 4368 and 5462 feet, respectively. These markers correlate somewhat low to deep tests to the south. Previous Ellenburger strikes in the county proved disappointing.

Collin County: Standard Oil Company of Texas' Newsome 1, John W. Cox Survey, A-159, Frisco geophysical prospect, resumed drilling after testing dry in Strawn at 6733-63 feet. This wildcat logged about 100 feet of hard tight sand with evidence of oil and gas and made 6 unsuccessful drill-stem tests above 6713 feet. The sand was pronounced subnormal in porosity and permeability. Trading has been confined to royalty as the company controls the area with a 15,000-acre block.

Humble Oil & Refining Company's Wester 1, A. J. Culwell Survey, A-209, a mile south of Weston, entered the anhydrite beds at 2370 feet, with elevation of 710 feet, and was drilling at 2400 feet on 7000-foot depth contract.

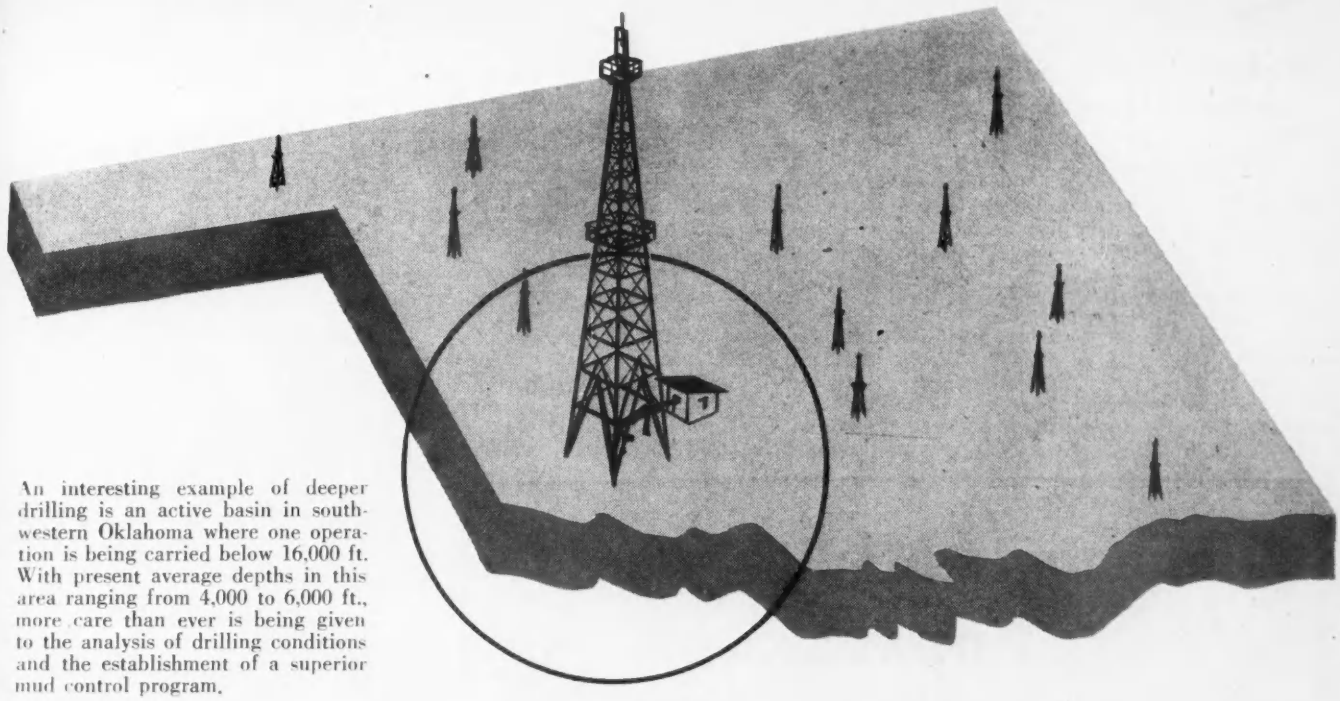
Wilbarger County: The Texas Company's Hauser 1, Wm. Alston Survey and 2 miles southeast of Oklaunion, entered unidentified lime at 7090 feet, and was drilling dry lime at 7150 feet. It is unusually low for the area. The company's Robertson 1, north offset to the Tolbert pool discovery, cemented 7-inch casing at 5178 feet with the well bottomed at 5211 feet, and will perforate opposite broken lime pay between 5026 and 5100 feet.

Grayson County: Denver Producing & Refining Company's Rich 1, I&GN Railway Survey, A-1439, deepest test in the district, has been delayed by a fishing job in Simpson shale at 11,710 feet.

Montague County: Continental Oil Company and Magnolia Petroleum Company's Tompkins 1, Labor 5, League 12, Calhoun County School Lands and 1 mile northwest of Dyemound, was drilling shale at 7440 feet. This wildcat logged sufficient showings to warrant setting pipe in Bend, topped at 6730 feet with elevation of 1179 feet.

Osage Officers Named

M. Darwin Kirk, counsel for Barnsdall Oil Company, Tulsa, has been reelected president of Osage Oil & Gas Lessees Association. Other officers elected at the annual meeting in Tulsa include W. D. Simms, Shell Oil Company, Inc., vice president, succeeding G. W. Davis of the same company, and Clarel B. Mapes, reelected secretary.



An interesting example of deeper drilling is an active basin in southwestern Oklahoma where one operation is being carried below 16,000 ft. With present average depths in this area ranging from 4,000 to 6,000 ft., more care than ever is being given to the analysis of drilling conditions and the establishment of a superior mud control program.

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☆ East Texas

Flynn Field's Third Producer Is Northwest Extensioner

Third oil producer in Flynn field, Leon County, is 1⅓ miles northwest extension; northwest outpost for Grapeland gas field, Houston County, shows promise of making an oil producer from the Woodbine; deep test in Coke field abandoned.

Leon County: United North & South Development Company's Oden 1, W. Martin Survey 7, 1⅓ miles northwest outpost for the Flynn field, succeded in excluding water after numerous squeeze jobs and was flowing a barrel of 35-gravity oil hourly by heads from new perforations at 7195-235 feet. This production is from streaks of saturated sand in the Woodbine, topped at 6900 feet, with elevation 549 feet. The well was drilled to 8112 feet in Edwards, topped at 7780 feet. Nearest producer is Daniel Oil Company's Cos 1, which flowed 72 barrels initial through ¼-inch choke, and the latter is 1½ miles west by north of Claude Bell's small pumping discovery. Sinclair Refining Company, pipe line division, has connected to the field. The area affords the greatest amount of proved undrilled acreage in the Woodbine district, and will receive considerable development this year in anticipation of greater concentration of pay sand in the section. It is the deepest Woodbine oil in the state.

Tex Harvey Oil Company's Powell 1, 3300 feet southeast of the Daniel-Cox producer, entered the Austin chalk at 6395 feet, and was drilling at 6430 feet in chalk.

Houston County: Geir-Jackson Recycling Company's Adams 1, Letson Purdy Survey and on the northwest edge of the Grapeland gas field, is credited with recovering 600 feet of oil when tester was used in the Woodbine. Additional oil-saturated sand was reported to have been recovered below this level but details were withheld.

Standard Oil Company of Kansas' Lundy-Humble 1, wildcat 11 miles west of Crockett, was idle for orders at 7507 feet in shale. A nominal show of gas was encountered before reaching water in the Woodbine, topped at 7120 feet.

Freestone County: The Texas Company's White 1, west outpost for the Fairfield gas field, was drilling lime at 13,465 feet.

Wildcats: Standard Oil Company of Texas' New Birmingham 1, Cherokee County prospective discovery, tested salt water with sufficient gas pressure to make brief heads from open hole in Travis Peak at 10,015 to 10,017 feet. Gun perforator accidently discharged near the 9900-foot level when undertaking initial perforations intended for 10,006-10,014 feet. In Rusk County, Tide Water Associated Oil Company-Seaboard Oil Company's Bird 1, Jas. McClain Survey, entered the Pettit at 6815 feet, and was drilling without shows at 6860 feet.

Wood County: Amerada Petroleum Corporation et al's Coke Unit 2, projected Cotton Valley or Smackover test for the Coke field, was abandoned at 9644 feet in Travis Peak, topped at 8345 feet, due to crooked hole. This test missed the 8100-foot gas-distillate production in the Young.

Shell Oil Company's Goldsmith 12, Quitman field Smackover test that has indicated production in the Rodessa, was drilling sand and shale at 8615 feet. Humble Oil & Refining Company's McKnight 1, northeast edge of the Hawkins field, was coring hard sand at 10,825 feet.

Sun Oil Company's Johnston 2, John Poly Survey and offsetting the single Woodbine (Dester) producer in the Manziel field, missed the pay in drilling to 4810 feet, and is completing from sub-Clarksville oil sand at 4040-56 feet.

Bobby Manziel et al's McCarley 1, northeast offset to the Woodbine discovery for the Norman-Paul field, missed the sub-Clarksville oil zone, and was drilling at 5215 feet.

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Compressed Gas Corporation

The first unit of the plant where this photograph was taken was erected during World War I. It is one of "Puritan's" model Oxygen gas plants. The Puritan Compressed Gas Corporation are not only pioneers nationally but were the first to operate an oxygen plant west of the Mississippi River.

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Harrisburg also manufactures: Alloy and Carbon Steels; Seamless Steel CO_2 Liquefiers, Pipe Couplings; Drop and Hollow Forgings; Forged Steel Pipe Flanges.

Harrisburg Steel Corporation

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Standard Oil Development Vice Presidents Are Named

Standard Oil Company (N. J.) has elected three vice presidents and directors to help meet requirements of an expanding research and development program of the Standard Oil Development Company, a subsidiary.

The new officers, who increase the number of directors to 14, are Willard C. Asbury, who will be in charge of contract and patent activities; E. Duer Reeves, and Dr. William J. Sweeney, who will direct the company's work in research and development. William R. Carlisle, a vice president and director of the development company, has been appointed associate general counsel of Jersey Standard.

Asbury is a native of Portland, Maine,

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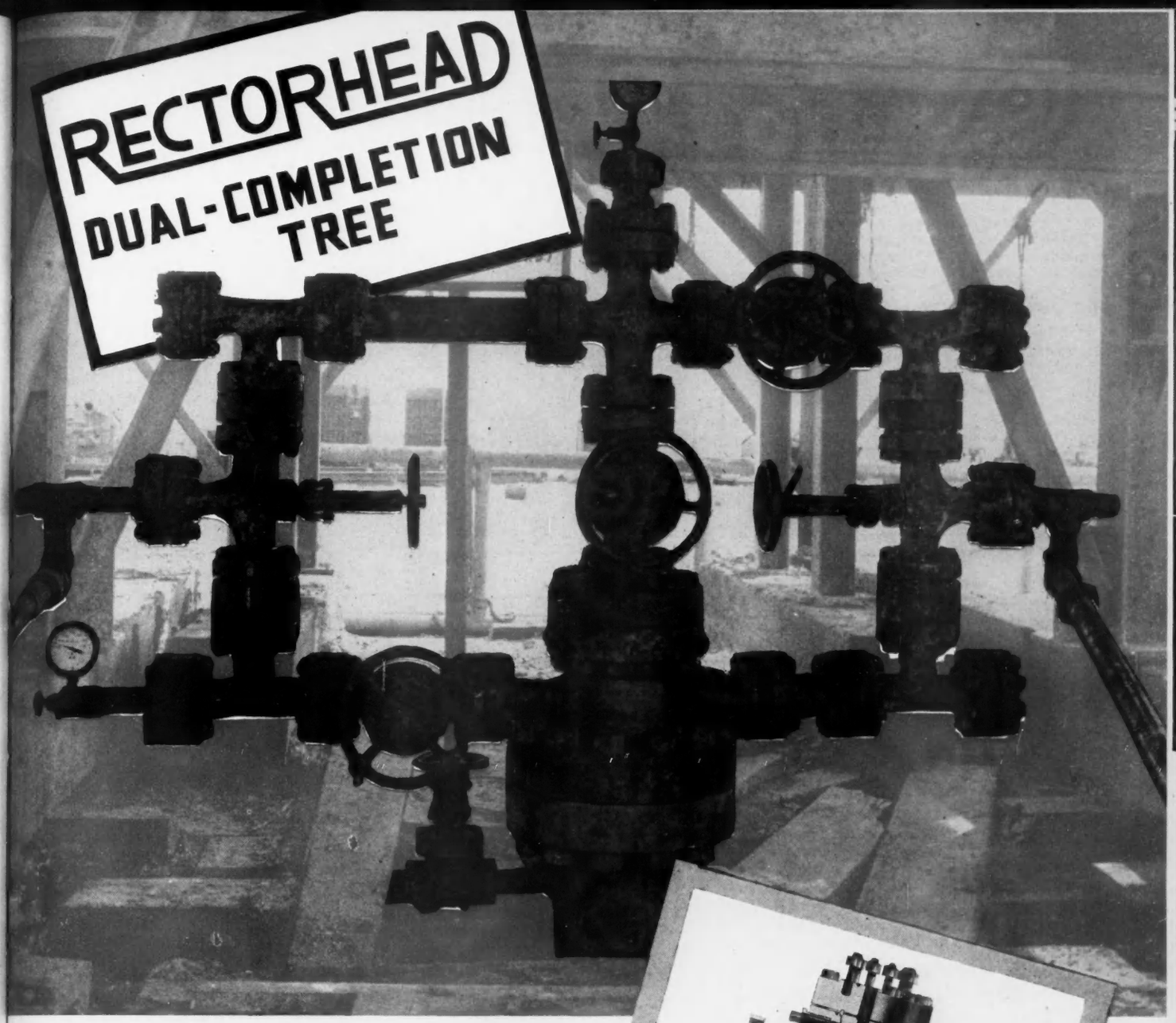
DUAL-COMPLETION TREE



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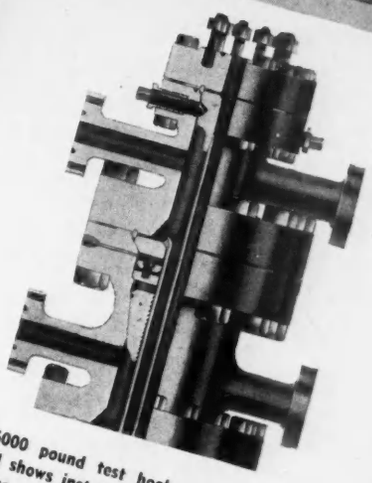
This Rectorhead double wing, all-flanged dual completion tree* has no resilient packing in tubing or casing head seals. Instead, these all-important seals are strong, safe, permanently secure because they are metal-to-metal. They will not deteriorate . . . won't disintegrate in corrosion preventive chemicals . . . won't burn out in case of fire . . . won't freeze and contract . . . won't require costly, dangerous changing during the life of the well.

RECTORHEAD casing heads with welded seals and tubing heads with metal-to-metal seals are the safest, surest, simplest you can install. Stronger, permanent, they give you trouble-free protection for the life of the well. Specify RECTORHEADS on your next well head installation.

*Detailed information furnished on request.



Rector 6000 pound test hook-up. Welded casing head seal shows installation of weld test pack-off for purpose of field testing weld. Tubing head has metal-to-metal seal. Casing head is available in 2000# to 15,000# test with threaded bottom connection and side outlets as well as all flanged.

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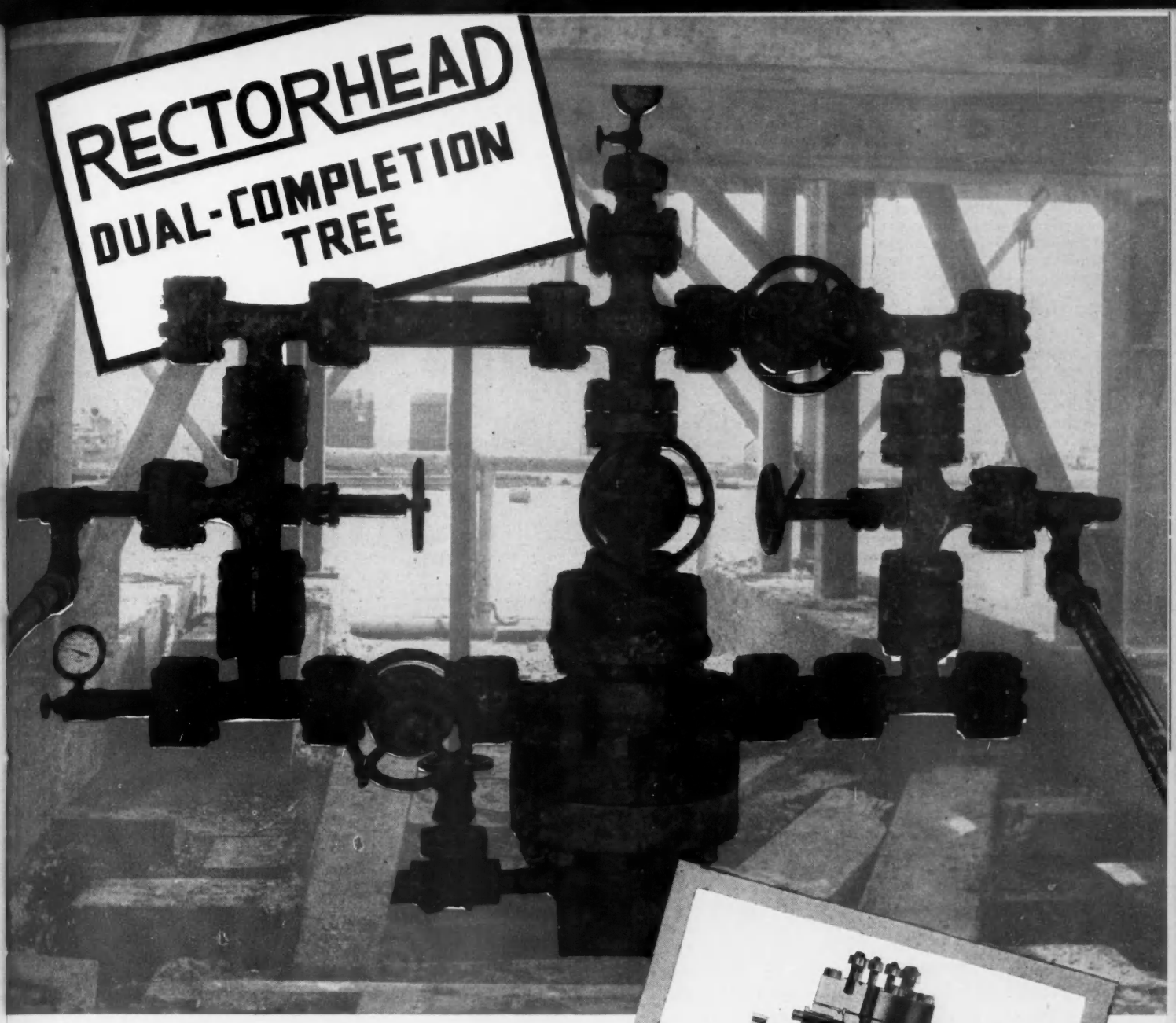

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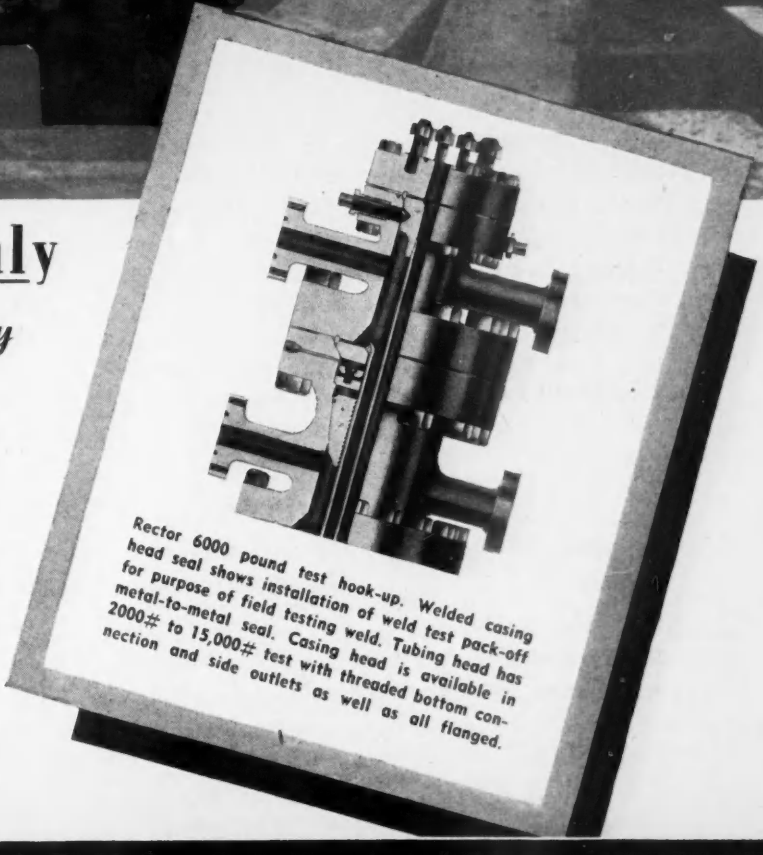

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and a graduate of the Massachusetts Institute of Technology. Reeves was born in New York City and is a graduate of Williams college and Princeton University. Dr. Sweeney, a native of Boston, received a bachelor's degree in chemistry at Massachusetts State College, and a master's degree in inorganic chemistry at Pennsylvania State College. Carlisle is a native of Atlanta, Georgia, and was graduated from Oglethorpe University.

Sun Buys Property

Purchase of a 60-acre tract of land at Marcus Hook, Penn., from The Pure Oil Company, together with tankage facilities, a dock on the Delaware River and buildings on the property, was announced by Arthur E. Pew, Jr., vice president of Sun Oil Company in charge of manufacturing.

☆ Southwest Texas

Gas Discovery Near Ohern Is Completed and Shut in

Gas discovery northeast of Ohern completed and shut in; wildcat west of Seven Sisters plugs back for completion as gas well; Dulup field well waiting on production test; sixth producer completed at Hughes.

Duval County: Tom Graham & Cam Corporation's Benavides 1, wildcat 2 miles northeast of Ohern field and 1¼ miles southeast of Cole field, has been completed as a dry gas well and shut in. No gauge of the gas flow was made, but while testing on 13/64-inch choke tubing pressure was 1180 pounds flowing and shutin pressure was 1240 pounds. Total depth is 3333 feet with 5½-inch casing set on bottom and perforated in a sand topped at 3320 feet.

Joe C. Palmer's Welder Heirs 1, wildcat in Sam Alexander Survey a mile west of Seven Sisters field, has been plugged back for completion as a gas well in the Loma Novia sand. The well tested on the pump from open hole at 2591-95½ feet, an estimated 60 barrels per day net oil and 70 percent fresh water and could not be completed as a commercial oil producer. The test topped the Mirando sand at 2587 feet.

Webb County: George Buck and J. N. Abel's Puig Bros. 6, northwest corner of Block 59, Dulup field, is waiting on potential after making an estimated 36 barrels of oil daily on pump.

Buck & Able's J. G. Garcia Heirs 2 has been completed as the sixth producer in the Hughes field, discovered in August, 1946, by Killam & Hurd's Garcia Heirs 1. On potential the well pumped 49½ barrels of 21-gravity oil daily with no water. Total depth is 1845 feet with 5½-inch casing set to 1830 feet.

Republic National Bank of Dallas

Statement of Condition December 31, 1946

RESOURCES

Cash and Due from Banks		$ 85,895,032.81
U. S. Government Securities		42,406,284.17
State, Municipal, and Other Securities		3,194,427.56
Stock in Federal Reserve Bank		600,000.00
Loans and Discounts		136,788,020.60
Banking House		2,205,141.69
Furniture and Fixtures		285,073.77
Real Estate for Bank Expansion		259,669.22
Customers' Liability—Acceptances and Letters of Credit		5,174,898.78
Total		$276,808,548.60

LIABILITIES

Capital	$ 10,000,000.00	
Surplus	10,000,000.00	$ 20,000,000.00
Undivided Profits		2,150,507.93
Reserve for Taxes, Etc.		1,597,521.73
Acceptances and Letters of Credit		5,174,898.78
DEPOSITS:		
Individual	$163,247,883.62	
Banks	79,795,331.27	
U. S. Government	4,842,405.27	247,885,620.16
Total		$276,808,548.60

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

☆ South Central Texas

Wildcat Northeast of Poteet Is Swabbing for Production

Wildcat northeast of Poteet swabbing for production; Humble testing Jourdanton outpost; Edwards County wildcat reported testing on pump; Crystal City wildcat bailing.

Atascosa County: McFarland Drilling Company's Krisch Estate 1, wildcat 3 miles north of Poteet, is swabbing again for production from the Austin chalk, showing brackish muddy water with a little oil. Total depth is 4001 feet with 5½-inch casing set to 3607 feet and perforated at 3568-78 and 3588-96 feet. The well was previously acidized through these perforations and swabbed to 1100 feet, showing some oil and gas, but tubing had to be pulled and reset after the swab hung.

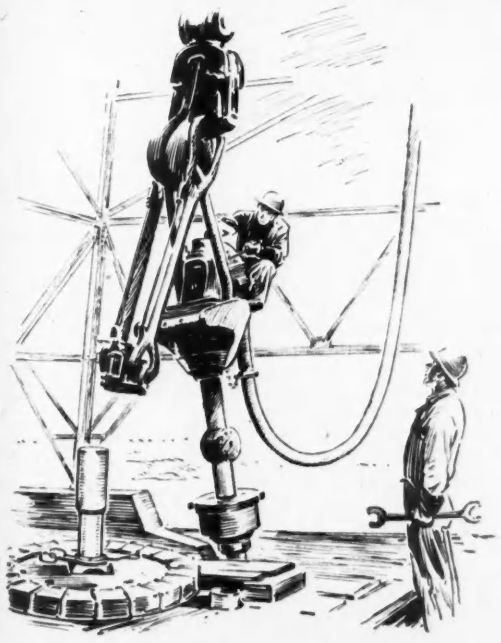
Humble Oil & Refining Company's SPJSA Lodge 1, wildcat outpost a mile west of Jourdanton field, is being retested after the flow on initial test died. From perforations at 7385-90 feet the well initially flowed oil with no gas for several hours. Tubing was pulled and reset and the perforations squeezed for a new test. Total depth is 7390 feet with 5½-inch casing set to 7386 feet.

Edwards County: J. O. Rogers Oil Company's J. S. Holman et al 1, abandoned wildcat in the northwestern part of the county recently taken over by Rogers, is reported pumping oil but with no details concerning production released. Total depth is 1010 feet with oil show at 605-27 feet and gas show at 548-60 feet. The well was originally drilled by M. C. Moore early in 1946 and Rogers took over the operation in recent months for further testing. This test is in CCSD&RGNG Survey 24, on a 160-acre lease.

Illinois Wells Sold

The Gordon Oil Company, Mt. Pleasant, Mich., has purchased, effective January 1, leases, equipment and 22 oil wells in the Mattoon, Ill., field from Joseph Kull, independent Mattoon operator.

When the going gets tough...



You need a man like this. He's your Oil Field Supply Specialist. He knows the punishment your drilling equipment must take.

He knows, too, that you can't afford to run the risk of costly delays caused by inefficient hose.

That's why your Oil Field Supply Specialist will recommend Monarch Rotary Drilling Hose. It's "Job-Engineered" by Hewitt to withstand the scouring effect of abrasive drilling muds.

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More than that, this hose is especially adaptable to flexible connections between mud hog pump and stand pipe. A smooth, oil-resisting synthetic tube assures maximum flow and long life. The cover withstands weathering, sun-checking, and abuse.

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Sometimes we get the question: What about B & W Wall Cleaning Guides in deep wells, where high temperatures make thick mud cake, all conditions are more severe, and the job of cementing is more difficult?

Well, a look at the record is the best way to show that B & W Guides are just as effective in deep wells as in shallow. Here are just a few of our many successful deep well jobs:

DEPTH	NO. OF GUIDES	SIZE CASING
13150′	12	4¾″
11744′	46	5½″
10875′	30	7″
10500′	33	7″
10419′	33	7″
10000′	48	5½″
10000′	15	5½″
9800′	40	5½″
9700′	106	5″

No matter what the depth, B & W Wall Cleaning Guides on the casing—plus casing movement while cementing—center the casing, remove mud cake and distribute the slurry around the casing for a successful cement job *the first time,* reducing the need for costly and dangerous recementing. Our new Bulletin 104 tells all about it. Why not send for it, now, while you think of it?

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☆ Lower Texas Coast

Lacy Field Discovery Well, Hidalgo County, Is Finaled

Production gauged at Lacy field discovery; Green field extension test discovers new pay zone; Fayette wildcat making production tests; new pay zone discovered at Alice; Live Oak County recovers condensate on drill-stem test.

Hidalgo County: Roger Lacy's Fee 1, discovery well of Lacy field, has been dually completed as an oil and gas-condensate producer. On potential the well flowed 74 barrels of 34-gravity oil daily through tubing with gas-oil ratio of 800/1. This completion was on gas-lift from perforations at 7983-88 feet. The gas-condensate completion was through the casing from perforations at 7455-65 feet where the well flowed an estimated 9½ million cubic feet of gas on open flow, gas-condensate ratio being 250,000/1. This field is 6 miles north-northeast of Mercedes townsite and 2 miles southeast of Mercedes field. Lacy has located Ann Lacy and Patsy Lacy Fee 2 as the second well in the field. It is 2640 feet east of the discovery.

Karnes County: Van Norman Oil Company's Mudd 1, extension test at Green field, 2450 feet southwest of Magnolia Petroleum Company's Russell-Atkinson 1, has been completed in a new pay zone. From perforations at 6464-66 feet in the Wilcox the well flowed 111 barrels of 38-gravity oil daily through 5-32-inch choke with tubing pressure 470 pounds, casing pressure 1275 pounds, and gas-oil ratio 400/1. Total depth is 6680 feet with 5½-inch casing set on bottom.

Fayette County: Standard Oil Company of Kansas' Pietsch 1, wildcat 8 miles north of LaGrange, is still making production tests in the lower Wilcox. An initial test at 6536-42 feet flowed gas and salt water with a slight spray of oil and 1450 pounds pressure, through ¼-inch choke. These perforations were squeezed for further tests at approximately the same level. Total depth is 6918 feet with 5½-inch casing set to 6641 feet.

Jim Wells County: Tom Graham's Trussell Unit 1 is being completed as a gas-condensate well in a new deep pay zone at Alice field. From perforations at 6465-75 feet the well showed on 3/16-inch choke, tubing pressure of 1850 pounds and casing pressure of 1900 pounds. Total depth is 7809 feet with casing set on bottom. Production in the Alice field has been at 5000 to 5500 feet. Trussell Unit 1 is on the west flank of production in the La Vaca Grant.

Live Oak County: Stanolind Oil & Gas Company's Harris 1, wildcat 2½ miles north-northeast of George West, recovered condensate on a drill-stem test. The test, made at 7350-60 feet, open 6 minutes, developed 500 pounds working pressure and recovered several gallons of condensate. Bottom hole pressure open was 2020 pounds and shutin, 2960 pounds. Following this test the hole was cored below 7440 feet.

Mountain Group Elects

Directors of the Rocky Mountain Oil & Gas Association elected the following members as chairmen of standing committees during their quarterly meeting in Casper, Wyo., on January 7: public relations, H. P. Macauley, Continental Oil Company, Denver; public lands, Frank M. Gower, The Texas Company, Denver; legal and legislative, Harry Chapman, The Carter Oil Company, Billings, Mont.; production, John Cullen, Stanolind Oil & Gas Company, Casper; natural gas, J. M. McIntire, Northern Utilities Company, Casper; finance, Fred Manning, Jr., Fred Mannings Drilling Company, Denver; taxation, A. Parker, independent, Casper.

Record Gun-Perforating Job Completed in California

The world's record gun-perforating job was completed by McCullough Tool Company in the latter part of December in a California coastal field well. A total of 4980, ½-inch burrless holes were shot along an interval between 6800-7750 feet. Pipe in the well was a full string of 5½-inch, 20-pound, Grade N-80 casing. Double, 3½-inch O.D. electrically-fired, 30-shot guns were employed, shooting 60 holes at each run with a spacing arrangement of six holes per foot. Total elapsed time for the job was 78½ hours, making an average of 64 holes per hour.

Prior to this time, and so far as is known, the greatest number of holes shot in a single well at one time was 3750, this job being done in a San Joaquin Valley, Calif., well.

☆ Upper Texas Coast

Orange County Wildcat May Become Discovery in Frio

Wildcat in northwest Orange County is possible discovery; third well completed in new North Port Neches field; production gauged at Willow Slough outpost; potential made at Cleveland field west outpost and wildcat south of Tide Haven.

Orange County: Hinkle Drilling Company's Miller-Vidor Land Company 1, wildcat in J. M. Swisher Survey 2, Abstract 316, northwestern part of the county, has picked up sands with oil show in the basal Frio. Sands with gas and condensate were cored at 6943-66 and 7279-89 feet, and an oil sand was cored at 7328-47 feet. Hole was then cored below the 7600-foot level. The test is reported running approximately 100 feet high structurally. Hinkle opened production off the north flank of Port Neches dome last September with a major oil strike, discovering North Port Neches field.

The third well and best producer for North Port Neches field is Shell Oil Company's Adcock 1, 660 feet east and a little north of Hinkle's discovery. On potential the well flowed 262 barrels of 37.4-gravity oil daily through ⅛-inch choke with flowing pressure on the tubing of 1250 pounds and 1525 pounds on the casing. Gas-oil ratio was 432/1. Total depth is 8777 feet with 7-inch casing set a foot off bottom.

Chambers County: Sun Oil Company's Hebert & Broussard 1, wildcat outpost a mile north of Willow Slough production, flowed 31 barrels of 46-gravity oil and 2½ million cubic feet of gas daily on initial gauge of production. Flow was through ¼-inch choke with tubing pressure 1250 pounds and casing pressure 300 pounds. The flow was showing 4

SHAFFER GATES
are easily installed*

...Saves Labor–Reduces Rig-Up Time–Minimizes "Cellar Clutter"

Another SHAFFER CELLAR CONTROL GATE *Advantage!*

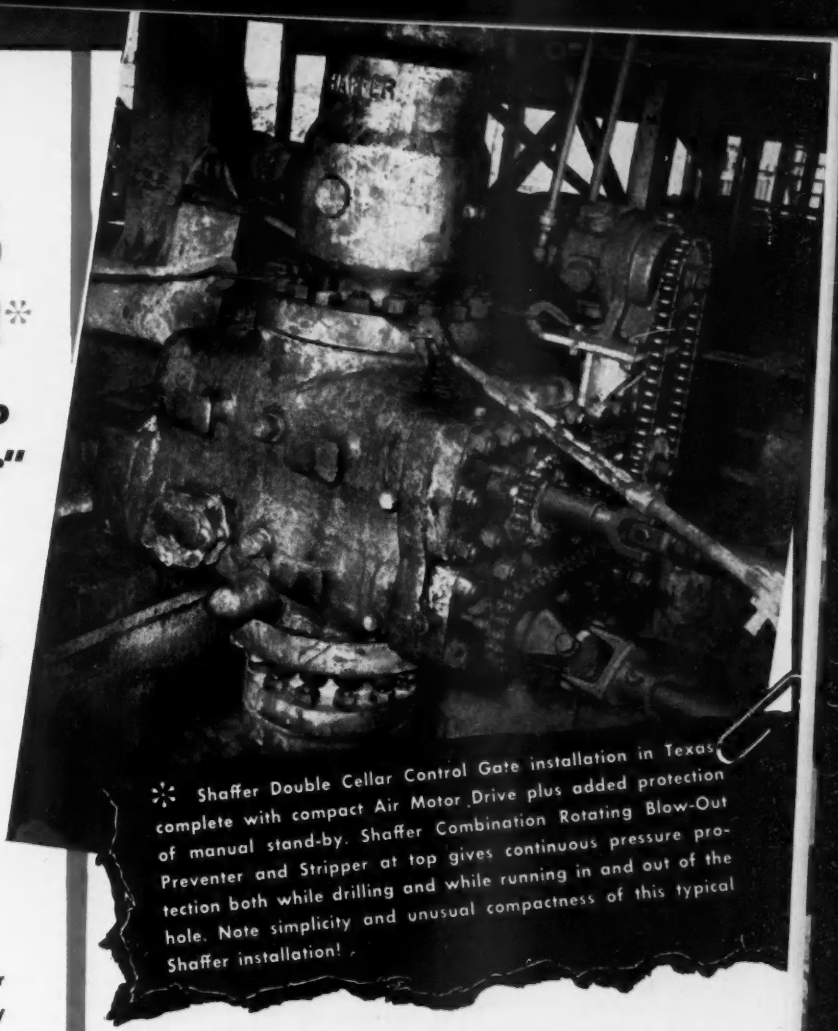
BESIDES ALL the other important Shaffer Cellar Control Gate advantages — such as maximum compactness, easy ram changes, foolproof mechanical operation, wide choice of power drives and still other features—Shaffer Gates provide the additional advantage that they are unusually simple to install.

For example, look at the typical Shaffer installation shown at right. This assembly not only contains a Shaffer Double Control Gate—with one compartment for closing off open hole and the other for closing off around the drill pipe—but it also contains a compact power drive that both opens and closes the Gate at the turn of a lever at the driller's side.

Everything necessary for complete and quick pressure control is in this installation, yet note that only two simple pipe connections to the rig floor are required—one line to open the Gate, the other to close it. No complicated manifolding, no jumble of pipe lines, no cluttered cellar to increase labor and rig-up costs . . . to complicate installation, maintenance and operation.

PLUS the Protection of Manual Standby

And note the two simple torque tubes connected to the Gate drives. This is an important Shaffer *plus* advantage, for by rotating these tubes by means of a convenient hand wheel, the rams may be easily opened or closed *manually* in case of a power failure—an additional vital safeguard available in Shaffer Cellar Control Gates!



* Shaffer Double Cellar Control Gate installation in Texas complete with compact Air Motor Drive plus added protection of manual stand-by. Shaffer Combination Rotating Blow-Out Preventer and Stripper at top gives continuous pressure protection both while drilling and while running in and out of the hole. Note simplicity and unusual compactness of this typical Shaffer installation!

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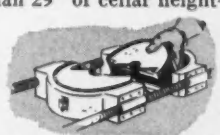
SPACE-SAVING COMPACTNESS: Even in the largest sizes, Shaffer Double Gates require less than 29" of cellar height—smaller sizes even less!



FAST RAM CHANGES: Shaffer Rams can be completely changed by removing just ONE end cover. Saves time, simplifies changes!

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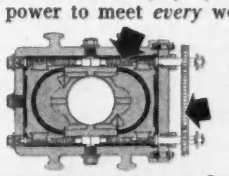

FOOL-PROOF MECHANICAL DRIVE: There are no uncertainties in operating Shaffer Gates because the rams are opened and closed by *direct mechanical drive* that is quick, simple, positive!

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percent emulsion. Total depth is 8464 feet in the third deviated hole with 5½-inch casing set on bottom and perforated for completion at 8350½-54½ feet.

Liberty County: Claud B. Hamill's J. C. Stuart 1 outpost that has extended production 6400 feet west at Cleveland field, flowed on potential 159 barrels of 41.2-gravity oil in 23 hours through 10/64-inch choke. Tubing pressure was 1150 pounds flowing and gas-oil ratio was 919/1. Total depth is 5782 feet with 5½-inch casing set on bottom and perforated for completion at 5770-75 feet. Production is from the Yegua in saturated sands topped at 5768 feet.

Matagorda County: Potential flow of Johnston & Johnston's Surkamp 1, wildcat nearly 2 miles south of Magnolia Petroleum Company's discovery at Tide Haven field, has been given potential. The well flowed 38 barrels of 43.5-gravity oil daily through 7/64-inch choke with 1900 pounds flowing pressure on tubing and gas-oil ratio of 13,100/1. Total depth is 10,055 feet with 5½-inch casing set to 9460 feet and perforated for completion at 8533-35 feet.

☆ South Louisiana

Prospective Discovery Near Mud Lake Field Is Tested

Magnolia tests prospective discovery northeast of Mud Lake production; Tuscaloosa sand confirmation test at Big Island runs production test; Laurel Ridge field extended east; Kaplan area wildcat still testing; Holmwood wildcat drilling deeper; North Oretta test abandoned.

Cameron Parish: Magnolia Petroleum Company's Lutcher 1-C, wildcat 4 miles northeast of Mud Lake field in 24-14s-11w, is a prospective gas and condensate discovery. The test is reported to have sands with gas and condensate showing at 9065-100, 9275-355, 10,145-85 and 10,401-07 feet with a dry gas sand at 10,435-535 feet. Total depth is 11,012 feet where casing has been set for production tests. Details of the hole below 10,500 feet have not been released.

Rapides Parish: Union Producing Company and M. H. Marr's John Tyler 1, confirmation test ½ mile east of the Belgard 1 Tuscaloosa sand discovery at Big Island field, has been completed as an oil well. The well gauged 152 barrels of oil in the first 4 hours through ⅜-inch choke with gas-oil ratio of 350/1. The flow showed 0.2 percent basic sediment with no salt water. Total depth is 10,200 feet with casing perforated at 9674-94 feet for completion.

Iberville Parish: Humble Oil & Refining Company's Hibernia Bank & Trust Company 1 has extended production east at Laurel Ridge field. The test flowed 89 barrels of condensate and 1,306,200 cubic feet of gas daily through ⅛-inch choke and was shut in. Total depth is 10,660 feet with 5½-inch casing set a foot off bottom and perforated for completion at 10,172-78 feet. The well is in 68-10s-14e.

Vermilion Parish: Humble's Romaine et al 1, wildcat in the Kaplan area, 25-12s-1e, is testing oil with the flow decreasing as testing progresses. On latest group of tests the well started flowing 64 barrels of 31.2-gravity oil daily through ¼-inch choke with 50 pounds flowing pressure on tubing. A later gauge indicated a decrease with a flow of 43 barrels of oil daily through ¼-inch choke with gas-oil ratio 115/1 and flowing pressure 70 pounds. Total depth is 12,482 feet with casing perforated at 11,006-80 feet.

Calcasieu Parish: Sohio Petroleum Company's Farmers Land & Canal Co. 2, wildcat in the Holmwood area, 26-10s-7w, is drilling deeper after setting 7-inch protection pipe. The test is reported to have sands with oil show behind the protection pipe at 10,320-31 feet, sands showing oil saturation at 10,350-70 feet and sands with oil odor at 10,780-90 feet.

Beauregard Parish: Magnolia has abandoned Lutcher-Moore 1-E, ¼-mile north of the Witzki 1 discovery in North Oretta field. Total depth is 8750 feet with no shows. North Oretta pool was discovered in January, 1946, and is 2 miles north of Oretta field production. The present dry hole is the second test in the field.

☆ North Louisiana

De Soto Parish Kickapoo Wildcat Is Being Completed

Kickapoo wildcat being completed on pump; Waskom area wildcat tests gas and distillate; 2 good producers completed in Haynesville and South Big Creek fields.

De Soto Parish: F. A. Callery's discovery, Bessie Strauss 1, in 19-14n-14w, Kickapoo area, was gauged on pump for 51 barrels of fluid, pumping and flowing, estimated to be 40 barrels of 43-gravity oil and 11 barrels of salt water, from perforations in the Paluxy at 4070-78 feet. Total depth is 7085 feet, with hole plugged back to 4125 feet, where production casing is set. Constant pumping of the well is expected to reveal whether formation water will increase and if the initial volume of oil will continue.

Caddo Parish: Stanolind Oil & Gas Company's Fred Wappler 1, C NE SW 20-17n-16w, east of the Waskom field area of East Texas, tested gas and some distillate from perforations at 6090-6102 feet in the Travis Peak and 5632-70 feet in the Pettit. The Pettit was treated with 5000 gallons of acid. Official tests will be made shortly.

Claiborne Parish: Grady H. Vaughn's A. P. Milner 2, C NW SE 22-23n-8w, recorded a flow of 33.75 barrels of oil in 21 minutes during a drill-stem test of the "Taylor" sand in the Haynesville field at 8941-63 feet. There was a 40-minute blow when operators started out of the hole with testing tool. The well will drill to the Smackover lime horizon recently discovered in the field, and which is the pay horizon in 2 good producers to date.

Franklin Parish: M. H. Marr Company completed a large producing well in the South Big Creek field, when Munson A-1, 17-16n-8e, recorded a flow of 487 barrels of 42.2-gravity oil per day through ¾-inch choke. It was an open hole completion with total depth 3397 feet, and casing cemented at 3372 feet. This is the fifth oil producer in the field.

Webster Parish: The Smackover lime new pay test in the Cotton Valley field, Cotton Valley Operator's Committee's Sam Banks 2, C SE NW 34-21n-10w, is drilling below 11,449 feet.

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Men and women are looking for eight-hour jobs and five-day weeks. Young men, who should think of the rugged road to success in terms of high adventure, want to stroll in impudent ignorance along the plateau at the top. Employers fill round holes with square pegs because any peg is better than none at all. Hard work is a lost art. Application is subservience. Long live Communism, the Unions and government subsidy of human endeavor! Those who pioneered this country were fools, corny and horny-handed yokels! You can be too honest and ambitious for your own good. This is a New Deal.

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THE CITY NATIONAL BANK

OF HOUSTON

Condensed Statement of Condition As of the Close of Business December 31, 1946

RESOURCES

Cash and Due from Banks	$48,674,014.25	
United States Government Bonds	38,835,265.04	
Municipal Bonds	466,498.01	
Federal Reserve Bank Stock	240,000.00	88,215,777.50
Loans and Discounts	29,176,478.91	
Commodity Loans Secured by Warehouse Receipts	4,041,806.29	33,218,085.20
Bank Premises	2,000,000.00	
Furniture and Fixtures	25,564.09	2,025,564.09
Interest on Securities—Earned But Not Collected		102,196.95
Customers Liability on Letters of Credit		993,606.55
TOTAL RESOURCES		$124,555,230.29

LIABILITIES

Common Stock	$ 4,000,000.00	
Surplus	4,000,000.00	
Undivided Profits	844,898.56	
Total Capital Account		8,844,898.56
Reserve Accounts		441,288.93
Liability on Letters of Credit		993,606.55
Deposits:		
Individual	86,480,663.72	
Banks	26,576,069.70	
United States	1,218,702.83	114,275,436.25
TOTAL LIABILITIES		$124,555,230.29

CAPITAL & SURPLUS $8,000,000.00

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MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

☆ Arkansas

First Tokio Sand Production Discovered in Falcon Field

First Tokio production found at Falcon field; second West Lewisville well to complete on pump.

Nevada County: First Tokio sand production for the Falcon field is at Spartan Drilling Company's Tully Works 1, C N½ NW SE 9-15s-22w. Operators have swabbed 150 barrels of 20-gravity oil per day but will rig up pump before taking completion gauge. Six barrels of oil per hour were swabbed on an earlier test, though the well did not make sufficient pressure to flow. Perforations are from 2106-12 feet with total depth of 3725 feet.

Lafayette County: McAlester Fuel Company will rig up pump to take official gauge at Rook A-1, C SE NE 17-16s-24w, which will be the second producer for the West Lewisville field. The well has been swabbing at the rate of 10 barrels of oil per hour with no show of formation water, and will be completed from perforations at 3819-33 feet. Rook A-1 is a west offset to the field discovery, but did not find the same pay zone which was completed through perforations at 3977-92. A south offset to the discovery will be started soon, Henry F. Briley having been granted permit for Owen 1, C NW SW 16-16s-24w.

Ouachita County: Mid-Continent Petroleum Corporation is starting work at J. P. Weaver 1, 21-14s-19w, 4 miles southeast of the Troy field on a fault line play extension. It will be a 3500-foot or Travis Peak wildcat, and of interest to operators working the fault line in this sector.

The Stephens Refining Company's Ella Wesson and Heirs 2, SE NE NW 23-15-19, Wesson field, made a gasser between 1521-31 feet in the Nacatosh sand. This has been shut off for a try for oil production.

☆ Mississippi

Jefferson County Prospect Tests Fair Shows of Gas

Fair gas shows noted in Jefferson County prospect; Yazoo test yields encouragement.

Jefferson County: The California Company's W. G. Greer 2, wildcat in NWc NE 10-9n-4e, has tested fair shows of dry gas from the flanks of the new McBride Salt Dome. The well was bottomed in salt at 2225 feet and casing was perforated at 1452-62 feet. Subsequently it flowed at the rate of 150,000 cubic feet of gas per day through ⅛-inch tubing choke. With ¼-inch choke the flow was rated at 250,000 cubic feet of gas per day. Tests continue. In the Fayette field's only test at present Humble Oil & Refining Company's Mrs. A. M. Stewart 2, 13-9n-1e, is preparing to test the productive zone with hole bottomed at 9630 feet. Cores at 9619-30 feet recovered a fair section of saturated sand.

Jones County: Gulf Refining Company's L. L. Majors 1, SEc NE 29-6n-11w, potential producer, continues to test in an effort to develop shows of heavy oil in the Eutaw and Upper Tuscaloosa zones. A 15-minute drill-stem test at 7595-7630 feet recovered 310 feet of fluid of which approximately 50 percent was oil. Several sands showing good saturation were also noted below this point and tests are continuing in an effort to establish limits of the productive section.

Yazoo County: The Carter Oil Company's Carl Day 1, C NE NE 9-12n-3w, wildcat, has encountered some encouragement from tests of the Tuscaloosa horizon with fair shows of gas. Several sections of the zone were cored and good odor noted at intervals of 6459, 6477 and 6497 feet. A drill-stem test at 6454-6506 feet yielded 700 feet of gas-cut mud and 4312 feet of salt water in 17 minutes. Tests continue.

Chickasaw County: Pan-American Producing Company's H. B. Carter 1, NWc SE SW 24-12s-4e, rank wildcat in the northwestern part of the state, has recovered stuck drill stem and is below 1510 feet in the Paleozoic. No shows have been noted.

Forrest County: The Superior Oil Company's Cassie Bradford 1, SEc SW NW 1-3n-13w, deep test, is understood to have moved out rig and shut down operations. It is generally believed that the well has been completed as a good producer with production established between 13,000 and 14,000 feet, but the company has no information to offer. Superior also rigging up for a second test of the area with its Maria Draughn 1, NEc 12-3n-13w, which will probably explore the deeper horizons.

Lamar County: Humble's Lamar County Board of Supervisors 5, NEc 16-1n-16w, Baxterville field, has been completed as a good producer from the lower Tuscaloosa zone. Casing was perforated at 8746-56 feet and swabbed in to establish initial production of 40 barrels of 15.4-gravity oil per day. Also in Baxterville, Gulf is preparing to complete Mrs. Ruby Entrikin 1, SEc SE SW 32-2n-16w. Several sections of the Tuscaloosa were perforated below 8760 feet and the well started flowing into pits at a rate of 225 barrels a day.

Florida

Two deep wells were drilling in the state; 1 still held up on fishing job.

Collier County: Humble Oil & Refining Company's Gulf Coast Realty 9, C SE/4 24-48s-29e, Sunniland field, is drilling below 11,385 feet with no shows.

Humble's other Sunniland test, Lee Cypress Lumber Company 3, SE SE 28-47s-29e, is drilling below 2570 feet.

Flagler County: Humble's J. W. Campbell 1, C SE SW 8-11s-28e, is drilling below 1870 feet.

Monroe County: Gulf Refining Company's Wildcat State 1, lse 373, SWc 2-67s-29e, is still bottomed temporarily at 14,070 feet on fishing job. No shows have been noted below 13,000 feet.

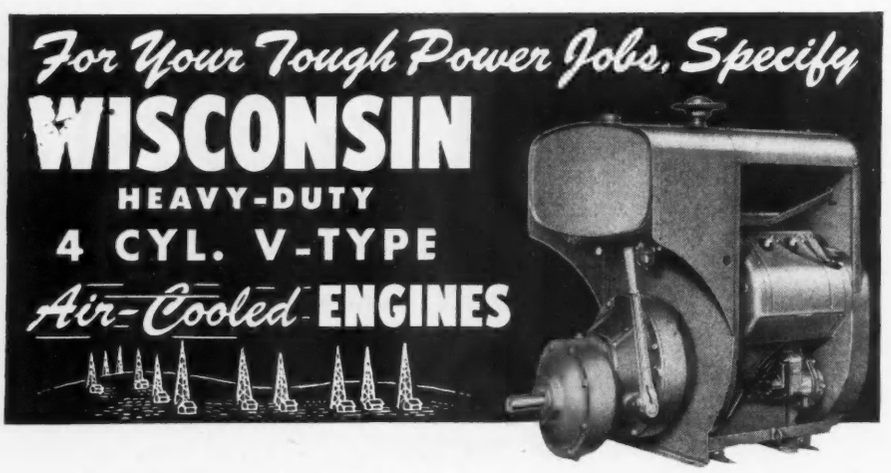
Gulf's State 1, Lse 374, SWc 15-67s-27e, is drilling below 6090 feet with no shows reported.

☆ Michigan

Ohio Building Derrick for Ogemaw County Deep Test

The Ohio Oil Company is building derrick on a proposed 12,000-foot deep test in West Branch field, Ogemaw County. Drilling is expected to get under way within 60 days.

Bay County: Lincoln Drilling Company's Johnson 1, S NW SW 36-18n-3e,



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CALIFORNIA: LOS ANGELES, AVENAL, BAKERSFIELD, SACRAMENTO, VENTURA WYOMING: CASPER
LOUISIANA: HOUMA, LAKE CHARLES, NEW IBERIA, SHREVEPORT KANSAS: ULYSSES

wildcat, logged Dundee lime objective at 2855 feet and bottomed out for abandonment at 3082 feet. Test was drilled on a farmout program with Sohio Petroleum Company. Last year Sohio drilled a small Dundee oil well a mile southeast of the Lincoln test.

C. L. Maguire, Inc., Mt. Pleasant, announced the purchase of 17 producing wells in the Kawkawlin and Essexville fields, from United Drillers and Producers, Inc. Wells are pumping an average of 200 barrels a day from the 2800-2900 foot Dundee zone.

☆ Ohio

Two Wildcats Started West of Zanesville, Muskingum County

Two wildcats started west of Zanesville; Blue Rock has combination well; third producer at Fultonham; Cleveland test has small show; Round Knob extension is failure.

Muskingum County: Two wildcats have been started west of Zanesville. J. L. Hunt et al's J. C. Rehl 1, NW 2, Springfield Township, is below 1500 feet, and the Zanesville Tool & Supply Company is in the Niagara with Smith Estate, Falls Township. Industrial Gas Corporation's U. S. A. 26, SW NW 2, Blue Rock Township, is showing gas in the Clinton and oil in the Medina sands. Only the Medina is to be shot, but both sands will be produced. The Pure Oil Company's L. M. Thompson 2, SW NW 25, Newton Township, had a fair show of both oil and gas in the Clinton at 3350-92 feet and after a shot, the well flowed 32 barrels of oil with 400,000 cubic feet of gas.

Cuyahoga County: Hoey et al Lynda Merkle 1, Lot 4, Solon Township, rank wildcat east of Cleveland, drilled through heavy Clinton sand at 3680-3807 feet, and found only a show of gas in the White near the bottom. The well was shot without results and has been shut down.

Columbiana County: The water line south of the Round Knob pool in Madison Township has been established as running southwest, and all drilling is now expected to keep north of the line. L. B. Smith's Wincie McFarland 1, NW NE 23, which helped establish the line, as ¾ mile east of the Powell 1, reached the Oriskany at 4468 feet, and showed some gas at 4473 feet, but this was drowned out by water at 4482 feet.

☆ Rocky Mountain Area

Wyoming's First Discovery of Year Is in Washakie County

Washakie County has Wyoming's first discovery of year; 2 dry holes likely on west side of Rangely field, Colorado; Twin Buttes, Montana, wildcat fails.

Wyoming

Typical of the development trend in the Rocky Mountain area, the first discovery of 1947 in Wyoming is a deep Basin test on the southeast side of the Big Horn Basin in Washakie County. G & G Drilling Company's Unit 1, SE NE NW 19-45n-92w, at Neibef Dome, perforated casing opposite the Embar lime section, 10,025-095 feet, and after swabbing to 7100 feet the well started flowing 41-gravity oil at the rate of 10 barrels per hour with 5 million cubic feet of gas. The well then froze and tubing is now being pulled to thaw and retest. This operation has been one of the most expensive in the Rocky Mountain region and has been drilling for 14 months. The well was drilled into Madison formation at 10,980 feet, and plugged back to the Embar for test.

About 25,000 acres were assembled by The California Company on Neiber Dome several years ago, and a farmout deal was made with Parker Drilling Company and others, who started the test with G & G Drilling as operator. The area is unitized, with a total of 14,558 acres within the unit. This structure is 20 miles south of the River Dome field, discovered early in 1946 by The Pure Oil Company, and similar producing conditions are experienced in that field. River Dome produces from 3 wells in the Embar formation below 10,000 feet, and mechanical conditions due to gas pressures and depths have hindered production considerably since discovery. Pure is now drilling 2 additional extension tests on the structure. Acidization in the River Dome wells has increased production considerably. Pure's Unit 3, NE SW SW 17-48n-92w, has been treated with 35,000 gallons of acid and production increased from approximately 40 barrels of oil per day to around 500 barrels per day, and the well is still testing.

At the South Fork test, midway between Neiber Dome and River Dome on the same anticlinal trend, General Petroleum Corporation's wildcat, SE SE SE 24-46n-92w, is now at 10,353 feet, total depth, running 7-inch casing. This test is now in the Tensleep formation and encountered saturation in the Embar similar to the other Basin tests reported above. The well is scheduled to test the Madison also, and will then plug back for a test of the Embar. No tests were made of the Embar section when the zone was drilled.

Eight miles north of the River Dome field at Five Mile Dome, The Carter Oil Company's wildcat is coring Frontier sands below 9200 feet. The well is Unit 1, C NW SW 20-49n-93w, and cores in the Frontier have shown some gas.

Colorado

Continental Oil Company is about to complete 2 dry holes on the west side of the Rangely field, Rio Blanco County, for the first definite definition of producing limits in this area. The company's Dorothy Rooth 3, C NE NE 27-2n-103w, is coring below 6781 feet with Weber sand topped at 6676 feet. Cores have shown almost no saturation, and a drill-stem test at 6666-6755 feet, with tester open 5 hours, recovered only 507 feet of rotary mud. Operator is coring in the Weber, but it is not likely that production will be found in this lower section since the majority of the prodcution in the field is above the —1100 foot datum. Present depth of the well is considered below the water level on this side of the field. Continental's Rooth 4, C NW NW 22-2n-103w, 1¼ miles northwest, is swabbing only 38 barrels of fluid per day from the Weber, topped at 6915 feet. The well was drilled to 6965 feet, and made considerable water from that depth after shooting, and was plugged back to 6950 feet. The fluid in the present testing is showing approximately 50 percent water, and the well is not considered commercial in its present status.

Montana

Union Oil Company of California has abandoned its Twin Buttes wildcat, State 1, C SE NW 16-2n-20e, Stillwater County, after finding water in the Lakota sand at 4082 feet. This test in the south central section of the state has held interest because it is located in an area which has considerable folding.

☆ California

Long Beach Field Southeast Output Is Staked by Shell

Shell stakes Long Beach field outpost; another failure in Alondra field makes field look small; deep test scheduled for North Belridge field; wildcat to be drilled near Coal Oil Point, Santa Barbara County; Monterey County prospecting flurry fading out.

Los Angeles County: Shell Oil Company will drill Dolley 2 as an outpost test on the north flank of the Long Beach field where the company recently acquired a 340-acre lease. There is 1 small, shallow producer on the property belonging to Stanton Oil Company. Shell will pass up this sand and explore for deeper production. The Stanton well is 270 feet south of the new Shell location and offsets Shell's Alamitos wells.

Richfield Oil Corporation has staked location for a development well on its Denni lease in the the same field.

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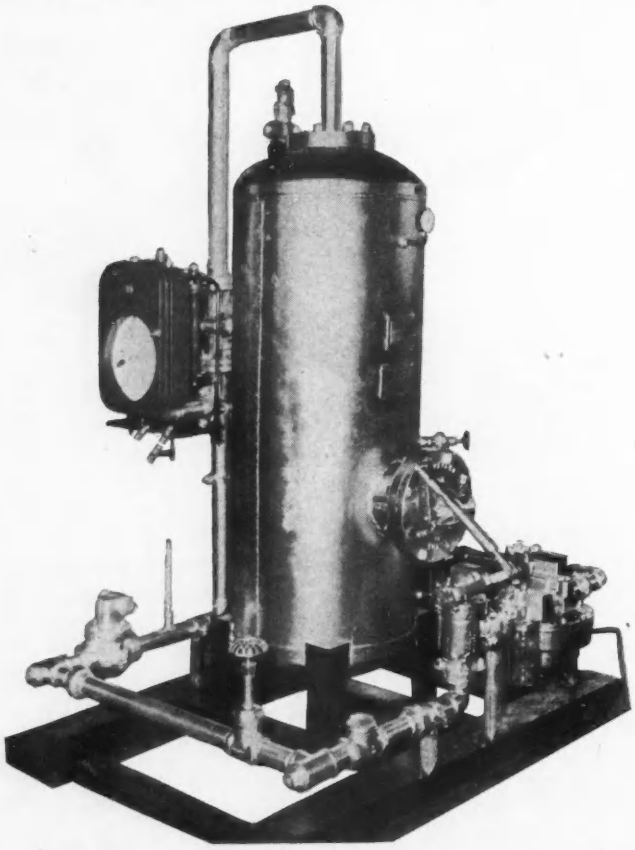

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the Alondra field began to fade when it became evident that the British American Oil Producing Company's Alondra Park 1 in 22-3s-14w was slated for abandonment. Production tests in schist conglomerate were unsuccessful, but operator is making a series of uphole tests before abandoning. This failure follows the abandonment 2 weeks ago of Gardena Community 9-1, drilled by British American, The Texas Company and Seaboard Oil Company. The latter well was only about ½ mile southeast of the discovery well of the field.

Standard Oil Company of California, which has been conducting a thorough prospecting campaign over a wide area east and southeast of the Santa Fe Springs field, abandoned Carmenita Community 1, outpost a few hundred yards east of the field in 4-3s-11w. The well was drilled to 11,367 feet.

Kern County: Richfield Oil Corporation is grading for Belridge B-2 at the north end of the Belridge field in 21-27s-20e. The company is reported looking for a producing sand below the Belridge 64 sand, deepest producing formation in the field.

In the South Belridge field, Belridge Oil Company is again making hole in its deep test, 62-W-33 in 33-28s-21e. Reports persist that the company has made a deep sand discovery. Total depth is about 14,025 feet.

Attempts to recover drill pipe by washing over and cutting in Pacific Western Oil Corporation's world's record depth well, National Royalties 1 in 5-26s-22e, have been successful, although about 2800 feet of pipe remain in the hole. A test indicated the pipe was stuck at the drill collars, so the more difficult part of the fishing job is ahead. The contractor, Loffland Bros. Company, believes it will be possible to continue drilling.

Santa Barbara County: Honolulu Oil Corporation and Signal Oil and Gas Company will drill a wildcat near Coal Oil Point about 2 miles southeast of the Elwood field, in 24-4n-29w. Considerable attention has been given to the area by wildcatters, notably Bolsa Chica Oil Corporation, which several years ago drilled 2 offshore tests.

Monterey County: The current wildcat play has been unsuccessful to date. There have been 2 failures in the last two weeks, leaving only 1 active test. Abandonment of Texas' Los Lobos wildcat at 3165 feet has been followed by the abandonment of Chanslor-Canfield Midway Oil Company's San Ardo test 2 miles west. Near King City, however, Shell continues below 2200 feet in a wildcat it is drilling jointly with Honolulu Oil Corporation.

Kings County: Progress in Standard of California's 73-30V wildcat on the Middle Dome of Kettleman Hills in 30-23s-19e, is being held up by another fishing job. With drill pipe stuck in the hole, the operator has shot just above the collars and is attempting to pull. Good showings were reported recently in this well.

Tulare County: The Superior Oil Company's Huntley 1 near the town of Goshen in 7-18s-24e is now a "no dope" hole. Last reported depth was 3548 feet. Current reports are that casing has been set for a test of Temblor oil showings.

Orange County: Tide Water Associated Oil Company has recorded leases on a block of land in 25-3s-10w, near Placentia, and will soon stake a wildcat.

ARKANSAS WILDCAT

Ashley County—Failure: McAlester Fuel Co.'s Crossett 1, ne ne 25-17s-6w, Wilcox 1662, Midway 2430, Gas Rock 2874, abnd 12-31-46 at 4547, pb 3200.

CALIFORNIA WILDCATS

Kern County — Failures: K. R. Mar-Roo Syndicate's K.C.L. 1, 18-29s-29e, Oildale area, San Margarita 2898, abnd 1-4-47 at 3100.

Par-Bell Oil Co.'s Conry 1, 30-28s-29e, Round Mt. area, Pyramid Hills 1755, Vedder 1890, abnd 12-31-46 at 2006.

Western Gulf Oil Co.'s San Emigdio 4, 19-11n-22w, San Emigdio area, abnd 1-9-47 at 3818.

Los Angeles County — Failure: Standard's Carmenita Community 1, 4-3s-17w, Santa Fe Springs area, abnd 1-9-47 at 11,367.

Monterey County—Failures: C. C. M. O. Co.'s San Ardo 6-G1, 6-23s-10e, San Ardo area, abnd 1-7-47 at 8062.

Texas Co.'s Aurignac 2A, 4-23s-10e, San Ardo area, abnd 1-5-47 at 3165.

FLORIDA WILDCATS

Bradford County—Failure: Tide Water's M. F. Wiggins 1, ne se 15-6s-20e, abnd 1-5-47 at 3167.

Suwannee County—Failure: Sun's Earl Odom 1, ne ne 31-5s-15e, abnd in shale 1-5-47 at 3157.

ILLINOIS WILDCATS

Clay County — Failure: Victor Drlg. Co.'s Lambert 1, ne nw nw 19-3n-6e, abnd 2984.

Clinton County — Failure: B. W. Quick's Holman 1, nw nw se 10-2n-1w, abnd 1467.

Coles County—Failure: E. P. Jarvis' Gray 1, sw se se 6-11n-9e, abnd 2500.

Effingham County—Failures: A. J. Slagter, Jr.'s Hooker 1, sw nw nw 21-6n-6e, abnd 2729.

Nat. Assoc. Pet. Co.'s Meyer 1, nw nw se 34-9n-6e, abnd 2517.

Fayette County—Failure: J. V. Buchman's Gagen 1, nw se ne 26-7n-2e, abnd 1063.

Franklin County—Failure: Indiana Farm Bureau's Coke 2, 16-6s-3e, abnd 3018.

Greene County—Oil Discovery: Collins Bros.' Baker 1, ne ne se 36-10n-14w, pump 5 bbls fr Carp sand, 1326-1430, td 1584.

Hamilton County — Failures: Frank L. Strickland's Karcher 1, nw nw se 12-4s-5e, abnd 3462.

Gilliam Oil Co.'s Sowers 1, se sw ne 12-5s-6e, abnd 3587.

Hamilton County — Oil Discovery: Nat. Assoc. Pet. Co.'s Smith 1, sw se sw 23-5s-6e, pump 71 bbls fr McCloskey, 3233-36, td 3359.

Jasper County—Failure: Robinson & Puckett's Newkirk 1, 18-7n-11e, abnd 2469.

Jefferson County — Failures: Halliburton Houghton's Warner 1, se ne ne 21-2s-3e, abnd 2831.

Halliburton Houghton's Parsons 1, sw nw sw 22-2s-3e, abnd 2963.

Madison County—Failures: E. A. Obering's Mossiman 1-A, 28-5n-5w, abnd 576.

Stoy Fox's Fee 1, e½ e½ sw 22-6n-11w, abnd 960.

Marion County—Failure: Cherry & Kidd's Hawkins 1, nw sw nw 29-1n-4e, abnd 2931.

Marion County—Oil Discovery: Paul Doran et al's Millican Estate 1, sw sw se 16-3n-4e, pump 59 bbls fr McCloskey, 2489-95, td 2499.

Monroe County—Failure: Keehn & McLaughlin Oil Co.'s Mueller 1, 11-2s-10w, abnd 525.

Moultrie County—Failure: Nat. Assoc. Pet. Co.'s Kimbrough 1, sw nw sw 10-12n-6e, abnd 2060.

Moultrie County—Oil Discovery: Illinois Exploration Co.'s Hardinger 1, sw sw ne 21-12n-6e, pump 1.5 bbls fr Aux Vases, 1937-52, td 2011.

Shelby County—Failures: Nat. Assoc. Pet. Co.'s Springer 1, sw sw nw 2-9n-6e, abnd 2429.

Nat. Assoc. Pet. Co.'s Buckmaster 1, sw nw ne 26-10n-5e, abnd 3565.

Washington County—Failure: N. A. Cummings' Brink 1, se nw nw 32-1s-2w, abnd 1567.

Wayne County—Failures: A. J. Slagter, Jr.'s Hedrick 1, sw sw se 28-1n-9e, abnd 3401.

Wayne Drlg. Co.'s Kirkpatrick 1, ne se nw 1-2n-5e, abnd 2973.

White County—Failure: Magnolia's Puntney 1, 19-3s-10e, abnd 3405.

White County — Oil Discoveries: B. M. Heath's Johnson 1, se ne nw 9-7s-8e, flow 50 bbls fr Aux Vases, 2930-45, td 2945.

Erie Ref. Co.'s Ouestell 2, se se nw 11-7s-9e, flow 84 bbls fr O'Hara, 2979-84, td 3076.

KANSAS WILDCATS

Barber County—Oil Discovery: Continental's Smith 1, nwc 21-33s-12w, pump 50 bbls fr Simpson, 4848-95, td 4895.

Barber County — Failure: Cities Service's Smith-Stump 1, se se nw 24-30s-13w, abnd 4676.

Barton County—Failures: Lindas & Stormfeltz's Schenck 1, c s½ se sw 35-17s-15w, abnd 3679.

Bridgeport Oil Co.'s Schneider 1-J, ne ne ne 31-17s-14w, abnd 3433.

Chase County—Failure: F. D. Strickler et al's Harshman 1, ne nw se 29-20s-7e, abnd 1935.

Cowley County—Failure: Dan S. Patton's Brown 1, c se se 34-33s-3e, abnd 3413.

Edwards County—Failure: Skelly's Miller 1, se se se 15-24s-17w, abnd 4720.

Kingman County — Failure: A. G. Hill's Wooldridge 1, sw nw nw 35-27s-8w, abnd 4531.

Marion County—Failure: S. & S. Oil Co. et al's Stallwitz 1, nw ne se 2-20s-4e, abnd 2582.

Pratt County—Failure: Stanolind et al's Curtis 1, se se ne 10-26s-15w, abnd 4605.

Rush County—Failure: J. M. Huber et al's Test 1, ne ne ne 10-17s-19w, abnd 4044.

Saline County — Failure: Westgate-Greenland Oil Co.'s Vanier 1, se sw nw 8-14s-2w, abnd 3400.

Sumner County—Failure: G. B. Cree et al's Frantz 1, 35-30s-2w, abnd 4336.

Trego County—Failure: Palmer Oil Co.'s Dietrich 1, nw nw se 36-11s-21w, abnd 4000.

NORTH LOUISIANA WILDCATS

Bossier Parish—Failure: W. K. Rowe et al's G. W. Hardy et al 1, c ne ne sw 10-23n-13w, 3 mi n Plain Dealing fld, Tokio 3045, abnd 12-23-46 at 3514.

Claiborne Parish—Failures: F. B. King-C. W. Sharp's Minnie Lowenberg 1, 1980 fr sl 527 fr wl 18-21n-7w, Tokio 2520, Comanche 3012, Pettit 3800, Travis Peak 4060, abnd 1-4-47 at 6614.

Union Prod. Co.'s J. N. Wise, Jr. 1, ne 15-23n-6w, Massive anhy 3295, Travis Peak 5285, abnd 12-29-46 at 5709.

Franklin Parish—Failure: James A. Goin's A. M. Black 1, nw ne 21-15n-7e at Baskin Twnsite, abnd 12-18-46 at 4406.

Richland Parish—Failure: Roy L. Fisher's Sarah F. Cooper 1, c sw nw se 21-17n-7e, 2 mi s Rayville, Wilcox 1286, Midway 1980, L. Cretaceous 2482, James 2910, abnd 12-30-46 at 3308.

Winn Parish—Failure: H. L. Hunt-Nebo Oil Co.'s Goodpine F-135, 1980 fr sl 660 fr el 35-

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■ For Sale—Star Drilling Machines. 1—No. 45 ST Spudder. 1—No. 47 Beam Machine. 1—No. 28 ST Beam Machine. All in running condition. Also 2—No. 30 Star Machines. Beaumont Petroleum Co., Beaumont, Kansas. Phone 16 after 6:00 P.M.

■ White, Model 630, tandem truck with heavy duty winch and oil field body, new 9.00 x 20 tires. Excellent for heavy winch work on location. $2,000. Box 116, c/o The Oil Weekly, Houston, Texas.

■ FOR SALE—Complete Work-over Machine with all necessary equipment. Franks Drawworks with 150 hp Waukesha Motor, 94' 315,-000 Cap. Lee C. Moore Cantilever Derrick. Wilson-Snyder 5 x 12 pump with 140 hp Waukesha Motor. Koelar Light Plant. Cameron Valves and all blow-out equipment. Small tools. This rig is complete and ready for operation. May be inspected at Refugio, Texas.

■ Cardwell K. L. Double Drum Rotary Drawworks. G. K. 145 Waukesha engine, perfect condition, can be seen operating at Luling, Texas. P. O. Box 709, Phone 596, Conroe, Texas.

■ Lumber for Sale: 3x6 and wider 10 to 16 rough oak $58.00. E. J. Gaiennie Lumber, Box 1074, Shreveport, Louisiana.

■ For Sale: 300 H. P. Clark RA3 Gas Engine Driven Compressor with or without compressor cylinders. Brand new. R. H. Armstrong, Box 1191, Texas City.

■ Complete power rig for sale for $12,500, without drill collars or drill pipe. Old timer, but in good shape and really does excellent work to 4000 feet depth. Has Gardner-Denver 7¼"x14" FXK pump. A good outfit for use on your own lease. For inventory, location, etc., write The Clay Brothers Drilling Company, Inc., 1804 Fair Building, Fort Worth 2, Texas.

FOR SALE

Complete Barite Plant

With 20' drier, 20' self feeding ball mill, Air Classifier, Conveyors, Motors, Sacking Machine, Building and Fixtures. Capacity approximately 5 tons per hour. Ready to run. Located at Kinder, Louisiana. Contact X. R. Randall, Trustee, Missouri Barium Corp. P. O. Box 831, Beaumont, Texas.

FOR SALE

■ 5 Complete Reda Pumping Units. Cables like new. 75 and 97 H.P. Motors. Max Steinbachel, 1905 Park Place, Wichita 4, Kansas. Phone 5-6082.

■ FOR SALE: 54 joints of 6⅝" drill pipe, 45' long, at $1.50 per foot; 30 joints of 6⅝" drill pipe, 30' long, at $1.75 per foot; 1 piece 50'x10¾" rat hole pipe; 1 6"x55' Kelly. The above is good drill pipe. All the above located in the Texas Panhandle. If interested, write The Clay Bros. Drilling Company, Inc., 1804 Fair Building, Fort Worth 2, Texas.

■ 80-84' M.I.W. STEEL DERRICKS, 159,000# CAPACITY — $325.00 F.O.B. CARS EAST TEXAS; 300,000' 6" O.D. .109 WALL NEW ELECTRIC WELD STEEL TUBING 900# HYDROSTATIC TEST, 2,000# BURSTING TEST, 45 CENTS F.O.B. CARS, LONGVIEW. LOUISIANA IRON & SUPPLY COMPANY, PHONE 21, LONGVIEW, TEXAS.

FOR SALE

6000' 4½" Drill Pipe
1—Model S. Cardwell Draw works with W. A. K. Motor
1—4-Speed shop-built Draw works with G. A. K. Motor
1—96' L. C. Moore Standard Derrick
1—60' Mast
1—Nearly new 612 P. Oil Well Pump with 145 G. K. U. Motor
1—5⅞ x 12 Old Style Oil Well Pump, New Liners, pistons & Rods
2—Light Plants
2—2¾ x 4 Fairbanks Morse Water Pumping Units
2—Kellys
2—Swivel
2—Rotary Hose
2—Sets Wilson Tongs
Slips, Elevators, etc., for 2 complete Rotary Rigs, less one Motor. Will sell all or part. Also one 1936 and one 1941 Chevrolet truck with winch; 1 Duall Trailer and one Float bed. E. B. Clark, Three Rivers, Texas.

For Sale: Gravity meter in excellent condition, reasonably priced for immediate sale. c/o Box 122, The Oil Weekly, Houston, Texas.

Priced for quick sale, complete drilling rig, 128' derrick, Waukesha motors and complete equipment. Contact F. J. Finch, Lesco Drilling Co., 427 Elm Street, Graham, Texas.

MAP CABINET: Oak finished plywood cabinet that stands against wall. Protrudes only 10 inches from wall, is 4 feet long and 5½ feet high. 48 four-foot long rolled maps of any diameter, or larger number of small maps, made easily accessible on individual horizontal shelves in three movable sections. Price $25.00. Editorial Department, The Oil Weekly, Box 2608, Houston, Texas.

HAVE AVAILABLE FOR IMMEDIATE SHIPMENT ALL PARTS FOR 2-CYLINDER WAUKESHA AIR-COOLED ENGINE, TYPE 150-U. Little Giant Tree Feller Corp., 202 South Haskell Ave., P. O. Box 695, Dallas 1, Texas.

LEASES IN SAN JUAN BASIN, NEW MEXICO

5,000 Acres in a solid block adjoining the Byrd-Frost Inc. Block. This block is 2 miles wide and 3 miles long, all situated in Township 27 North, Range 11 West, N.M.P.M. Tom Bolack, 210 Mass. St., Winfield, Kansas.

FOR SALE

■ Well drilling machines, Fort Worth, Wichita, Keystone, Star spudders, standard outfits; Sullivan drills, steel derricks, tools, cable. All equipment overhauled or rebuilt and guaranteed. S. W. Pressey, Pueblo, Colorado.

WANTED TO BUY

■ Wanted for Cash—3000 ft. portable rotary rig. Must be in A-1 condition. O. W. Killam, Laredo, Texas, Phone 578.

HELP WANTED

■ Land man for company operating throughout Midcontinent. Must be well rounded and should have wide acquaintance and knowledge of Gulf Coast areas although not absolutely necessary. Replies will be confidential. Box 106, The Oil Weekly, Houston, Texas.

■ GRAVITY PARTY CHIEFS AND OPERATORS with experience for domestic work in new fast-growing concern. College degree desired but optional dependent on experience. Exploration Surveys, Inc., 1914 North Harwood St., Dallas 1, Texas.

■ **WANTED ESTIMATING ENGINEER**—Man with engineering degree preferred. Should have practical experience in estimating in petroleum refining plants, chemical plants or related industrial plants. Experience should include estimating of industrial buildings, structural steel, concrete foundations, process equipment, piping and electrical work. Major petroleum company in Chicago. Give complete details first letter. Address Box 118, The Oil Weekly, Houston, Texas.

■ Experienced Reflection Computers for Party Chief training by contracting company. Give experience, education, age, and telephone number. Our employees know about this Ad. Box 119, Oil Weekly.

Attractive position for experienced seismograph party chief. Considerable opportunity. Permanent location. Apply in care of Box 117, The Oil Weekly, Box 2608, Houston 1, Texas.

EXPERIENCED PARTY CHIEFS—SEISMOLOGISTS AND OBSERVERS

are wanted for foreign seismic parties

United Geophysical Company, Inc.
595 East Colorado Street, Pasadena 1, California
822 Thompson Building, Tulsa 3, Oklahoma

WANTED

Graduate Engineers

Well-known petroleum engineering organization needs competent Graduate Engineers — petroleum, mechanical, or chemical — for field work. Experience not necessary. State all qualifications, including age, etc., in letter.

P. O. Box 5810 Dallas, Texas

SITUATIONS WANTED

■ GEOLOGIST AVAILABLE FOR PART-TIME CONNECTION IN HOUSTON. Box 120, c/o The Oil Weekly, Houston, Texas.

■ Geologist. B. S. Degree. Subsurface experience in Mid-Continent and West Texas. Box 121, The Oil Weekly, Houston, Texas.

LEASES, DRILLING, ACREAGE, ETC.

■ JOHN O. BANKS pays top prices for producing royalties, 302 Gilbert Bldg., Beaumont, Texas.

Would like to farm out large block for the drilling of one or more holes, or be financed and drill myself on pro rata basis. Will accept undivided interest, override, checkerboard, oil payment. Great possibility of shallow as well as deeper production. Horizons which produce elsewhere present in this locality are: Fort Payne, St. Louis-Warsaw, Clinton, Wayne, Trenton. Complete information, prospectus, maps, etc., upon request. Box 123, The Oil Weekly, Houston, Texas.

11n-5w, 12 mi w Winnfield, abnd 1-3-47 at 9428.

Claiborne Parish—Failure: H. L. Hunt et al's Climon Spivey 1, 1980 fr sl 652 fr wl 17-23n-6w, 4 mi nw Colquitt, abnd 1-8-47 at 5330.

Grant Parish—Failure: W. E. Allaun's Allaun Fee 1, c sw se 14-7n-2w, 1 mi w of Dry Prong, abnd 1-7-47 at 5467.

Richland Parish—Failure: M. E. Wakefield's Annie K. Baker 1, c ne nw nw 1 mi e of Mangham, Cane River 1062, Wilcox 1250, Midway 2178, Gas Rock 2645, Tuscaloosa 2650, Paluxy 3424, abnd 1-11-47 at 3513.

SOUTH LOUISIANA WILDCATS

Plaquemines Parish—Failure: Texas Co.'s State-Delta Duck Club 18, 1550 s 994 e of nwc 33-20s-20e, ¾ mi e ne prod at Delta Duck Club, abnd 1-3-47 at 12,056.

St. Landry Parish—Failure: Danciger O&R So.-W. W. Hawkins' Opie Dimmick 1, 3230 s 27° w fr nwc sect 40 in 26-7s-4e, 3 mi n Shuteston fld, in Belleview area, abnd 12-31-46 at 10,565.

St. Martin Parish—Failure: Humble's Williams 1-B, 1980 nly alg el fr sec sect 25 th wly parallel to sl 660 in 25-14s-11e, 4 mi sw W. Lke Verret fld, Duck Lake area, abnd 1-10-47 at 12,500.

West Feliciana Parish—Failure: W. E. Allaun's Rosedown Plantation 1, 7260 fr nwc 67-3s-3w, St. Francisville area, abnd 1-3-47 at 7530.

MISSISSIPPI WILDCAT

Holmes County—Failure: Skelly's W. M. Spann 1, sw se 22-14n-1w, Wilcox 1416, Comanchean 6228, abnd 1-8-47 at 6996.

MONTANA WILDCATS

Fergus County—Failure: Rock Creek Bench Oil's Wessen 1, ne ne nw 36-14n-16e, Rock Creek Bench, 3rd Cat Creek 1323-1372, abnd 2800.

Stillwater County—Failure: Union of Calif.'s State 1, c se nw 16-2n-20e, Twin Buttes, Dakota 3765, Lakota 4082, Morrison 4110, abnd 1-5-47 at 4118.

LEASES, DRILLING, ACREAGE, ETC.

OFFICES

Available for Occupancy in Houston on or about May 1, 1947

Superb new modern building, under construction, completely air-conditioned, conveniently located to downtown business section at 900 Lovett Blvd., without parking problems—one block from community center with post office, cafeteria, bus service, etc. Building designed by foremost architects, single story, with carpeted floors, panelled walls, acoustic ceilings, outside plate glass exposures for all offices, finest lighting. Tenant's specific requirements may be incorporated into construction of building.

Approximately 2000, 4000, or 6000 ft. on 5-year or longer lease.

Write or call: **Robert W. Kurtz,** 1719 Vassar Street, Houston 6, Texas, Lehigh 8419.

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■ Oil Industry Employment Service, P. O. Box 2603, Tulsa, Oklahoma. For technical and trained personnel. Licensed. Bonded. Confidential. No agency charge.

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Regular classified advertisements for this special section, set in type this size without border, take flat-rate of 7 cents per word for the first insertion and 5 cents per word for each subsequent insertion of same copy. Display advertisements for this section, set in suitably larger type with ruled border, are $5.00 per inch for the first insertion and $4.00 per inch for subsequent insertions. Remittance must accompany copy which should be sent to:

Trading Post Section, The Oil Weekly
P. O. Box 2608 Houston 1, Texas

NEW MEXICO WILDCATS

Chaves County—Oil Discovery: DeKalb Agricultural Assn.'s Lewis-Federal Unit 1, c se sw 12-10s-25e, elev 3721, San Andres 730, Glorietta 1750, Clear Fork-Yeso 2100, Abo 4096, Hueco 4760, Pennsylvanian 5070, granite wash 5493, Dacite 5526, granite 5630, pump 6¾ bbls 25-gr, 9 bbls wtr, 7500 gals acid, San Andres pay 1247-75, td 5650, pb and comp 12-13-46 at 1275.

Eddy County—Failures: Potash Company of America's Briggs 1, c se ne 22-21s-23e, elev 3846, Glorietta 2035, Yeso 2067, abnd 12-31-46 at 4007.

Martin Yates, Jr. et al's Kaiser 1, (OWDD) 330 snl 990 ewl 29-18s-27e, otd 1483, elev 3285, abnd 1-5-47 at 3660.

Harvey E. Yates et al's State-Yates 1, c sw ne 32-18s-30e, elev 3422, abnd 12-31-46 at 3995.

NEW MEXICO NEW PAY TEST

Lea County—Penrose-Skelly Deep Failure: Skelly's Steeler 2, c ne ne 17-23s-37e, (OWDD) otd 7200, elev 3333, base Permian 7686, Devonian 7674, Fusselman 7680, Montoya 8345, Simpson 9710, McKee 10,119, Ellenburger 10,528, abnd 1-1-47 in dolomite at 10,589.

OKLAHOMA WILDCATS

Choctaw County — Failure: Cargill Bros.' Cowley 1, se se sw 23-7s-15e, abnd 2012.

Comanche County—Failure: Art Wagoner's Wyatt 1, nw nw nw 16-1s-12w, abnd 1915.

Cotton County—Failures: Bay Pet. Co.'s Anderson 1, se se sw 5-2s-13w, abnd 2040.

Bay Pet. Co.'s Crockett 1, c w½ sw nw 9-2s-13w, abnd 1505.

Loual Drlg. Co.'s Hooper 1, sw sw sw 15-4s-12w, abnd 1750.

Keener O&G Co.'s Arnt 1, se ne ne 16-4s-15w, abnd 5124.

Garvin County—Failures: J. N. Crofton's Plummer 1, se se se 1-3n-2w, abnd 5775.

Sohio's Lavalley 1, sw sw ne 24-2n-1e, abnd 3050.

Greer County—Failure: E. K. McLennan's Meadows 1, sw nw nw 27-4n-22w, abnd 4410.

Pawnee County—Failure: Herndon Drlg. Co. et al's Kelly 1, ne nw ne 24-22n-4e, abnd 3800.

WEST TEXAS WILDCAT

Andrews County—Failure: Royal O&G Co.'s Lotus 1, c se sw PSL 18, blk A-48, elev 3281, Yates 2985, San Andres 4540, Glorietta 5680, Tubb 6590, Fullerton 6880, Mississippi 8530, Devonian 8995, abnd 1-5-47 at 9180.

WEST TEXAS NEW PAY TEST

Andrews County—Dollar Hide Silurian Discovery: Magnolia's Cowden 2-B, c sw se PSL 4, blk A-55, ne offset to Devonian prod, elev 3159, Yates 2610, Permian-Devonian contact 7495, Silurian 8160, flow 535 bbls 43.6-gr, natural via ¼-in, gor 270/1, Silurian open hole 8345-65, comp 1-12-47 at 8365.

WEST CENTRAL TEXAS WILDCATS

Callahan County—Failures: H. F. Pettigrew et al's Pippin 1, 850 snl 1300 wel sect 3158, TE&L Co. sur, abnd 12-31-46 at 1020.

Tom Potter et al's Heyser 1, 2250 snl 1035 wel of T. B. Owens sur, elev 1722, abnd 12-31-46 at 1903.

Ed. C. Lawson-Anderson-Prichard Oil Corp.'s Hutchinson 1, 467 out nwc sect 136, BBB&C Ry. sur, elev 1803, Palo Pinto 2170, Bend 3795, abnd 12-24-46 at 3875.

Jones County—Failure: Hugh G. White et al's Humphrey 1, c ne se sect 45, Deaf & Dumb Asylum Lands, elev 1637, base Sedwick 1565, Camp Colorado 1715, Tannehill 1885, Saddle Creek 1930, King 2289, reef lime 3012, abnd 12-20-46 at 3511.

Shackelford County—Oil Discovery: Street Investment Co.'s W. H. Green 1, 960 snl 2040 wel s½ T&P Ry. 49, blk 12, elev 1602, pump 35 bbls, sand 1203-1207, comp 12-28-46 at 1207.

Shackelford County—Failure: Standard of Kansas' Green 1-D, c sw nw T&P Ry. 68, blk 12, elev 1812, Palo Pinto 2832, Bend 4242, Ellenburger 4800, abnd 12-23-46 at 5005.

Stephens County—Failure: Tom Palmer et al's Ford 1, 330 wel 2196 snl of D. D. Wright sur, elev 1176, abnd 12-23-46 at 4382.

Taylor County — Failures: Alder Oil Co.'s Keny 1, 330 out sec w½ labor 2, Lge 146, Grimes CSL, elev 1836, anhydrite 1190-1370, base Sedwick 2000, Dothan 2086, reef lime 2935, abnd 12-24-46 at 3030.

Hedrick Oil Co.'s Lee 1, 330 out sec labor 15, Lge 124, Grimes CSL, elev 1839, Valera 1250, Flippen lime 2488, Hope lime 2649, Gunsight 2790, abnd 12-23-46 at 2797.

B. H. Hilburn-V. E. Autry et al's Brown 1, 1765 snl 6718 wel of Jose Gabo sur 128, elev 1741, Flippen lime 2294 Hope 2444, Swastika 2680, abnd 12-29-46 at 2708.

EAST TEXAS WILDCATS

Henderson County—Failure: Humble's Benge 1, 660 out nwc of 91-ac tr, 3550 wel 6200 nsl Wm. D. Ratcliff sur, elev 455, Pecan 2364, Austin 3385, Woodbine 4252, Comanche li 5058, Goodland 6175, Paluxy 6357, abnd 1-8-47 at 6642.

Navarro County—Failure: C. P. Porter et al's Goldman 1, 570 fr swl 450 fr nwl of Michael Shire sur, abnd 1-6-47 at 1639.

EAST TEXAS OUTPOST

Van Zandt County—Van Shallow Failure: W. W. Bradley et al's McKibben 1, 330 out swc of 125-ac tr, Wm. Daniel sur, 1 mi n of prod, elev 444, Nacatoch 1456, abnd 1-7-47 at 1510.

SOUTH CENTRAL TEXAS WILDCATS

Guadalupe County—Oil Discovery: Wiegand Well Servicing Co.'s L. A. Anderson 1, 330 fr nwl 1000 fr swl 101-ac tr, Harriet Cottle sur, ½ mi sw old Luling fld, Buda 2035, Austin chalk pay 1847, open hole comp 1850-2050, 4000 gals acid, pump 2 bbls oil, comp 12-15-46 at 2035.

Medina County — Failure: J. C. Hawkins' Brieden Est. 1, 330 fr wl 1000 fr sl D. Lieber sur 38, 5 mi sw Devine, abnd 12-31-46 in Austin ch at 2402.

SOUTHWEST TEXAS WILDCATS

Duval County—Failures: Texas Co.'s W. R. Peters Fee 1, 330 fr wl 2279 fr sl BS&F sur 188, 500-ac lse, ½ mi se se flk oil prod at Piedras Pintas, abnd 12-19-46 at 6608.

Continental's Robt. Driscoll Est. 92-A, 1750 fr nl 1320 fr el sect 49, Sta. Rosalia Gr, 12,000-ac lse, n of Conoco Driscoll prod, abnd 1-4-47 at 3360.

H. H. Howell's Schallert 1, 3380 fr el 900 fr nl SM&S sur 255, 400-ac lse, nw flk Palangana salt dome, abnd 12-23-46 at 5040.

McMullen County—Failure: Henshaw Bros.-E. H. Smith's Nueces Ld. & Cattle Co. 1-B, 990 fr nel 330 fr nwl BS&F sur 169, 2 mi ne Munson fld, 320-ac "B" lse, abnd 12-29-46 at 2020.

Starr County—Failure: V. F. Neuhaus (was G. R. Boyle's) 330 fr sel 1757 fr swl tr 2-B out of sh 2, La Sacatosa Gr, 262.18-ac lse, abnd 12-27-46 at 1720.

Starr County—Oil Discovery: V. F. Neuhaus (was Tarver & Staggs Co.'s) Loreto Canales 1, (OWDD) 498 fr se&nwl 4700 fr swl tr 3-B of sh 2, Sacatosa Gr, and 262-18-ac lse, otd 1602, pay 1700, perf 1707-14, pump 2 bbls 42-gr oil, no gas, comp 12-20-46 at 1715.

Webb County — Failure: E. H. Stickney's Rosa V. de Benavides et al 1, 460 fr sl 1000½ fr el sur 1088 on 80-ac lse, blk 13, 2 mi sw W. Cole fld, abnd 12-26-46 at 3106.

SOUTHWEST TEXAS NEW PAY TEST

Starr County—Kelsey South Oil Discoveries: J. O. Clark, Jr.'s Margarita G. de Juarez 1, 467 fr n&wl 151.6-ac lse, Sta. Teresa Gr, 2250 se Gonzales A-2, deep sand disc in fld; dual comp: new pay 5364, perf 18 shots 5369-72, flow 144 bbls 51-gr, 9/64-in, gor 1185/1, cp 875 lbs; new pay 5869, perf 30 shots 5871-76, flow 124 bbls 42-gr, 9/64-in, gor 680/1, tp 700 lbs, comp 12-28-46 at 7272.

LOWER TEXAS COAST WILDCATS

Bee County—Oil Discovery: S. Donzis' Holzmark 1, 1380 at ra fr nwl 282.52-ac lse, 1435 at ra fr swl J. A. York sur, 10 mi nw Beeville, ¾ mi sw Holzmark oil fld disc, 1 mi s se Foley fld, n of Holzmark gas prod, Hockley oil pay 3490, perf 120 shots 3486-3424, 100 gals acid, pump 3 bbls, comp 12-1-46 at 3540.

Karnes County—Failure: Southern Minerals Corp.'s T. Pawlik 1, 330 fr se&swl 200-ac lse, 330 ne of swl F. Carillo sur, 7 mi ne Falls City, abnd 12-27-46 at 6210.

Refugio County — Gas Discovery: Clymore Co.'s J. L. Zarsky 1, 650 ne of swl 304-ac lse, 2904 w of el lse and sw¼ sect 6 Johnson & Pugh sbdn, 1 mi n La Rosa fld, 1¾ mi sw N. La Rosa fld, pay 4926, perf 4926-37, flow 50 mln gas open, comp 12-27-46 at 7035.

LOWER TEXAS COAST NEW PAY TESTS

Brooks County—E. Alta Mesa Distillate Discovery: Standard of Tex.'s B. G. de Garcia Lse 1-6, 12,500 fr sl 1400 fr wl La Encantada Gr, pay 6246, perf 6246-58, 6262-68, flow 52 bbls dist, 2,310,000 gas, ¼-in, gor 48,000/1, comp 12-18-46 at 6740.

Jim Wells County—Tijerina-Canales Oil Discovery: Texas Co.'s H. C. de Tijerina 38, 7245 w of el A. Canales sur 360, 1787 s of nl 3000-ac lse, perf 40 shots 5990-6000 in zone 17-B, flow 73.13 bbls 51.9-gr oil, 1.7% wtr, 5/32-in, gor 502/1, comp 12-27-46 at 7472.

TEXAS GULF COAST WILDCAT

Wharton County—Failure: P. R. Rutherford's Guy F. Stovall 1, 1285 s 330 fr el 80.66-ac tr, T. W. Heard sur, sect 30, 1¼ mi se Louise oil prod, abnd 12-19-46 at 7326.

WYOMING WILDCAT

Carbon County—Failure: Texas Co.'s Unit 1, ne ne se 14-20n-81w, Mill Creek, Nugget 4350, Tensleep 5677, Pre-Cambrian 6344, abnd 1-4-47 at 6389.

WYOMING NEW PAY TEST

Fremont County—Steamboat Butte Madison Failure: British American's Tribal 6-E, nw ne nw 5-3n-1w, Amsden 7299, Madison 7368, pb to Tensleep 6736, perf 650 shots 6736-6995, flow 1000 bbls, comp 1-8-47 at 8006.

Union's Shops Sold

Union Oil Company's service and maintenance shops and equipment have been purchased by Key Contractors, Inc., which with H. E. (Bud) Giles as president, will begin contract work February 1. The equipment purchased includes welding shop, electrical shop, carpenter shop, paint shop, boiler shop and incidental transportation.

"Best Bet Yet"

TUBING WIPED CLEAN!

Code: TUNICATE

Wipes tubing dry. No oil to drip on hoist, rig or tools. Rugged alloy steel housing holds free-floating, self-centering, standard Patterson-Ballagh Special Rubber Wiper.
Housing bolts to flange type heads on bolt centers 9 to 16". Tubing spider is set on top of housing which is constructed to take heaviest tubing loads. Three eye bolts, provided with hammer nuts, lock down lid to hold wiping rubber.
Special Rubber Wiper uses same tension principle as Patterson-Ballagh Drill Pipe Wipers. Steel reinforcing ring, molded inside rubber, makes center wiping web flexible, resilient yet firm, durable, and long lasting. Flash-fireproof.

Order complete assembly by code name: TUNICATE. Wiping rubber replacement, code: WINNOW. Send for Catalog No. 180 or see your Supply Store.

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SQUEAKS from the BULL WHEEL

Do Tell

"I'd like to marry a girl who doesn't smoke, drink, neck or tell dirty jokes."

"Why?"

The Woman's Way

"Am I good enough for you, my dearest?"

"No, John. But you're too good for any other girl."

The Soft Answer

"Am I the first man you ever kissed?"

"Good gosh! Why does every man I meet have to ask me that same fool question!"

Hints for Householders

"I have my husband eating right out of my hand."

"That must save a lot of dishwashing."

Naturally

A visitor to an asylum asked an inmate his name.

"George Washington."

"But the last time I was here, you were Abraham Lincoln."

"Sure. But that was by my first wife."

Poet's Nook

Kiss me, darling, kiss me
Hold me oh so tight.
I want to get in practice
For a date tomorrow night.

Encore

There was an old lady from Brussels
Accused of wearing two bustles.
Said she, "It's not true;
That's a thing I don't do;
You are simply observing my muscles."

Cream of the Crop

Said one little milk bottle to another: "Let's neck."

"No, let's go curdle in the corner."

Bathe in an Overcoat?

"It's pretty cold tonight, son. You'd better wear your gloves when you go driving with your girl."

"Not me, Mother. I feel better without them."

Signs of the Times

Sign in a machine shop: "Girls, if your sweater is too large for you, look out for the machine. If you are too large for your sweater, look out for the machinists."

Sign outside a beauty shop: "Men, don't whistle at the pretty girls who leave here. One of them may be your grandmother."

The Gentle Approach

"Sailor, just how long is this car going to keep stalling?"

"Just as long as you do, Baby."

Nice Job

"If I'd ask you to become my secretary at $100 a week, would you say yes?"

"Often."

This Curious World

Then there was the G.I. overseas who loved his wife at home and also a-broad.

She was only an electrician's daughter, but she had low resistance.

Love is one game which is never called on account of darkness.

A husband is a fellow who runs things around the house—especially the lawnmower.

Said one stork to another: "Is my face red! But how was I to know they weren't married?"

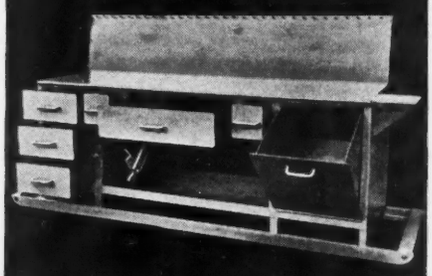
Southern Comfort

A Northern gentleman was being entertained by a Southern Colonel on a fishing trip. It was his first visit to the South, and the mosquitoes were so bothersome that he was unable to sleep, while, at the same time, he could hear his friend snoring audibly. The next morning he approached the old darky who was doing the cooking—

"Sam," he said, "how is it the Colonel is able to sleep so soundly with so many mosquitoes around?"

"Ah'll tell you', boss," the old darky replied, "de fust part ob de night de kernel is too full to pay any 'tenshun to de skeeters and de last part ob de night de skeeters is too full to pay any 'tenshun to de kernel."

OWEN



Type "A" Work Benches

Keep Tools Where You Need Them—When You Need Them

Yes sir, these benches will really pay off when you're in a bind and need a wrench in a hurry. They keep all hand tools within quick, easy reach and prevent misplacement, damage or loss.

Made of heavy steel plate, they're all-welded for strength and drawers are roller mounted for easy operation. There's plenty of storage space for hand tools, grease guns, rags, etc.

Buy one for each of your rigs . . . they'll save time, tools and tempers.

Sold Through All Supply Stores

California Distributor: Howard Supply Co., Los Angeles

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ROUTE 9 BOX 600-B V-2-4241
HOUSTON, TEXAS

B. E. Parsons, vice president and director of production for General Petroleum Corporation, has retired and is succeeded by **Max S. App,** who has been manager of the producing department. Parsons joined the company in 1914 as a geologist. App went to General Petroleum in April, 1912, as an engineer at Taft, Calif.

Max S. App

J. Howard Pressley has become manager of the Dallas district for Sun Oil Company, and **Samuel M. Gladney** assistant manager. The district includes all of the southern and southwestern states except the area along the Gulf Coast. Pressley went to work with the company under **J. Edgar Pew** in Beaumont, Texas, in 1902. He was serving as agent, attorney-in-fact and chairman of the management committee at the time of this appointment. Gladney was, until January 1, assistant superintendent of the land department.

H. A. Mason has been named assistant to the manager of laboratories for General Petroleum Corporation, with headquarters in Los Angeles.

W. E. Brown, who has been field engineer in the East Texas field for Tide Water Associated Oil Company, has been made district engineer at Magnolia, **Ark.**

M. J. Adams, assistant manager of the West Texas-New Mexico division of the Texas Company production department, Fort Worth, has been transferred to the new gas division at Houston.

Guy R. Mabee and **B. R. Matthews,** both of Midland, Texas, have organized the Guy Mabee Drilling Company, with capital stock of $50,000.

H. S. McQuain, R. F. Townsend and T. B. Know, all of Big Spring, Texas, have incorporated the McQuain Drilling Company, with capital stock of $20,000.

Harold Decker of Pan American Production Company last week was elected chairman of the Gulf Coast Section AIME at its meeting in Houston. He succeeds **Mercer H. Parks,** of Humble Oil & Refining Company, 1946 chairman. Other officers elected were vice chairman, **Carl Polk, Jr.,** Dowell Incorporated, and secretary-treasurer, **George L. Nye,** City National Bank, Houston, reelected for a second term.

Harold Decker

A. S. Trube, reservoir engineer for Tide Water Associated Oil Company, has been transferred from Kilgore, Texas, to Houston.

H. Rabun of Dallas and associates have incorporated the Nubar Oil Corporation to operate in Texas, with headquarters in the Republic National Bank building, Dallas.

G. Reed Schreiner has been named assistant director of advertising for U. S. Steel Corporation of Delaware, succeeding Reese H. Price, resigned. Schreiner formerly was advertising manager for Carnegie-Illinois Steel Corporation. **Robert J. Wilcox** was named acting advertising manager of Carnegie-Illinois.

William M. Stratford was elected president of Texaco Development Corporation, succeeding **R. J. Dearborn,** who has retired after 27 years of service. **William P. Gee** and **Charles F. Teichmann** were elected vice presidents. Stratford has been with Texaco since 1919, starting as a chemist in the Port Arthur research laboratory as did Gee and Teichmann. He became vice president in 1933. Teichmann was patent attorney for The Texas Company for some years prior to joining Texaco.

Roger Harrold, scout for The Ohio Oil Company, was elected president of the New Mexico Oil Scouts Association, which has headquarters at Hobbs. **William W. Wilson,** Repollo Oil Company, and **E. H. Roberts, Jr.,** Drilling & Exploration Company, Inc., were chosen vice president and secretary, respectively.

Earle H. Clark has been appointed membership secretary of the Texas Mid-Continent Oil & Gas Association. He succeeds the late **W. H. Pullman** as head of membership activities. Clark has been a former special agent for the FBI, which he joined in 1942. He was a football coach at Midland, Texas, before that, and had oil field experience as a roustabout while working his way through Texas Christian University.

Earle H. Clark

Fred M. Golding, C. C. Farris and **J. L. Nesbitt,** all of Houston, have organized the Golding-Farris Drilling Corporation with headquarters in the Second National Bank building, Houston.

J. W. Gordon, Jr., E. C. Hastings and **A. L. Gordon,** all of Pampa, Texas, have incorporated the Lenox Oil & Gas Company.

B. E. Van Arnsdale, Casper, Wyo., has been named manager of the land department of General Petroleum Corporation's Rocky Mountain District.

Charles E. Dimit has resigned as assistant to the chief engineer of the Gulf Coast Division of Tide Water Associated Oil Company to become affiliated with Creslenn Oil Company. He will move from Houston to Dallas.

Gotkool
WATER CANS
& COOLERS
GOTT Water Cans are the practical way to keep drinking water cool for long periods, protected from impurities and always handy to the job. Snug fitting large removable top, strongly built to withstand rough usage. GOTT Water Coolers have extra large covers and a handy non-leaking push button faucet. Your Supply Store has them, get one today! . . . . . .
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GOTKOOL WATER CAN
Made in 1½, 2, 3, 5, 10, 15 and 20 gallon sizes. (Push-Button Faucet at slight additional cost.)
GOTKOOL WATER COOLER
Made in 2, 3, 5, 8, 10, 15 and 20 gallon sizes with Push-Button Faucet.
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
KEEP PURE DRINKING WATER ALWAYS HANDY

MEN IN THE INDUSTRY NEWS

Don D. Montgomery, El Dorado, Ark., resigned January 1 as chief geologist for MacMillan Petroleum Company, and has opened offices at El Dorado, where he will be engaged as a consulting geologist. He will devote some time to the Montgomery Drilling Company, of which he is president.

»

M. R. Mitchell, formerly division land man for Tide Water Associated Oil Company, with headquarters in Casper, Wyo., has been transferred to San Francisco to be assistant general land manager. **A. E. King,** formerly division land man for Tide Water at Bakersfield, has taken over Mitchell's former post at Casper.

»

Ralph Neuhaus, vice president and general manager of the Hughes Tool Company, was named regional vice president of the National Association of Manufacturers, succeeding Noah Dietrich, an executive vice president of Hughes. Neuhaus will direct the association's activities in Louisiana, Oklahoma and Texas.

»

R. L. Pebworth, former manager of The Continental Supply Company's Houston store, has reentered the company's employ as manager of the Odessa, Texas, store. He succeeds **H. W. Carter,** who will be field salesman at the same point.

G. Lawton Johnson has been named assistant general manager of sales for National Tube Company and will handle the distribution of products manufactured at Christy Park Works, McKeesport, Penn., and some of the company's other fabricated goods. Johnson formerly was sales engineers for Midwest Pipe and Supply Company and later manager of eastern sales for Graver Tank and Manufacturing Company.

G. Lawton Johnson

»

Leonard E. Matzner has been chosen advertising manager for Mack Manufacturing Corporation. He has been serving the company as assistant advertising manager.

»

T. D. Collins has been appointed vice president in charge of Mid-Continent direct sales for International Derrick & Equipment Company, with headquarters at Dallas. He entered the supply business in 1927 with The Continental Supply Company, and was manager of West Texas, North Texas, and New Mexico divisions at the time he joined IDECO.

Harry E. Lorenz of Chicago has been appointed purchasing agent of Carnegie-Illinois Steel Corporation. **C. H. Baringer** and **F. G. Buchheit** have been made assistant purchasing agents.

Deaths

William H. Taylor, Sr., 52, Houston independent oil operator, was found shot to death in his Houston home January 9. Taylor went to Houston from Tyler in 1932 as land man in charge of the South Texas-Louisiana district for Amerada Petroleum Corporation. A year ago he went in business for himself.

»

Roy Watson, 46, production foreman for The Texas Company and its employe for more than 30 years, was killed January 11 when the automobile he was driving to his home in Plain Dealing, La., was struck by a train at Springhill, La.

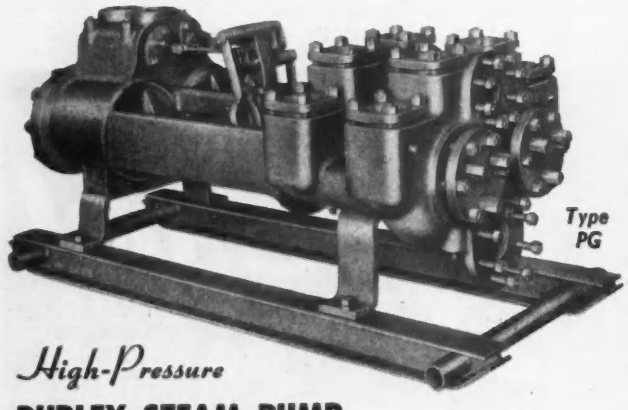
»

Harvey Worth Hillebrandt, Sr., 41, assistant division operation superintendent for Lane-Wells Company, died January 15 in Houston.

»

Edwin Elmore Bewley, chairman of the board, Fort Worth National Bank, died December 21.

LOCKETT-WORTHINGTON



High-Pressure

DUPLEX STEAM PUMP

Dependable performance is typical of both Worthington Pumps and Lockett Dealer Service to companies producing and handling oil. Worthington Pumps and *genuine* Worthington Repair Parts are available — through Lockett Dealers — from Warehouses maintained in the principal oil fields of Texas and Louisiana, backed up by a large replenishing stock at our Houston and New Orleans Warehouses.

Whatever your pumping problem may be — whether you require a pump or a complete pump unit for a specific type of work—you are assured of getting prompt, dependable service through a Lockett Dealer.

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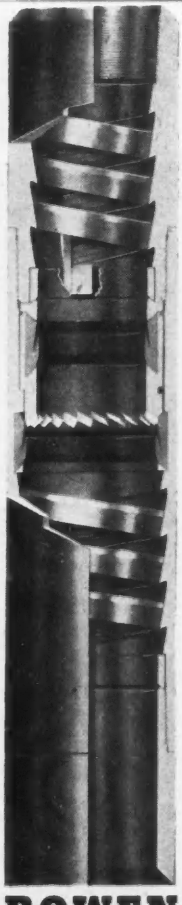

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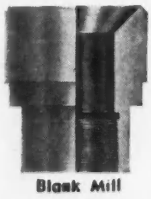
FOR TUBING

2" — 4 1/8" O. D.

2 1/2" — 4 11/16" O. D.

catch and pack off • Plain Tubing • Upset Section • Plain Collars • Upset Collars and Mill over Ragged Tubing All With One Tool.



Blank Mill

Upset Section Packer Assembly Patented

With one of these "Series 285" Bowen Tubing Overshots you are always prepared to fish for any size your string of tubing may present. Specifications are shown on page 621 in the Composite Catalog.

Catalogs with complete details will be mailed promptly upon request.

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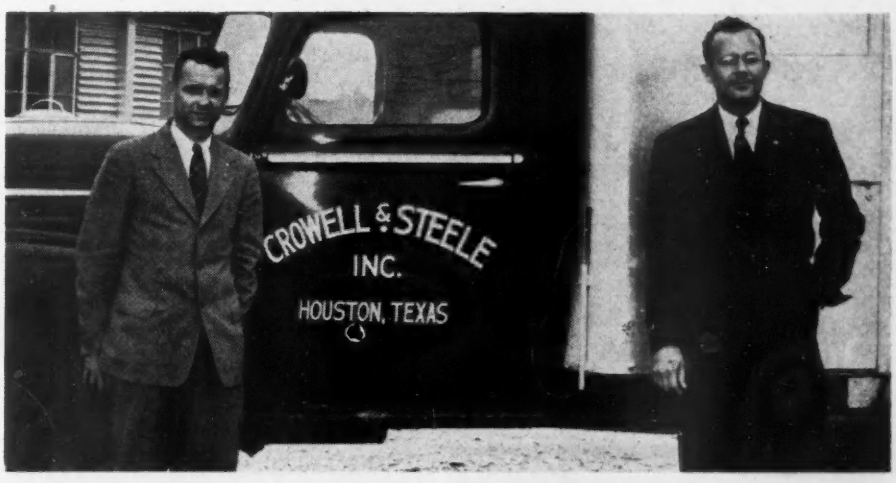
National Supply Names Manager; Northwest Headquarters Moved

J. W. (Pete) Gillespie, manager of the Wyoming-Montana District of The National Supply Company since 1924, has been appointed manager of the Northwest Division, succeeding I. G. Wetherill, who is retiring after 45 years with National Supply.

The company's division headquarters are being moved from Denver to Casper, Wyo. This move is being made because of existing company-owned facilities at Casper and because it is centrally located in Gillespie's new territory, which includes Western Canada, Montana, Wyoming and Colorado. The Denver district office is not affected by this change, and the manager there, C. L. Bainter, will continue to supervise the National Supply stores at Craig, Colorado, and Rock Springs, Wyo.

R. M. Fifer, who formerly supervised National Supply operations in Northern Montana, is the new district manager at Casper. Stores in his district are at Kevin and Cut Bank, Mont., and Cody and Casper, Wyo.

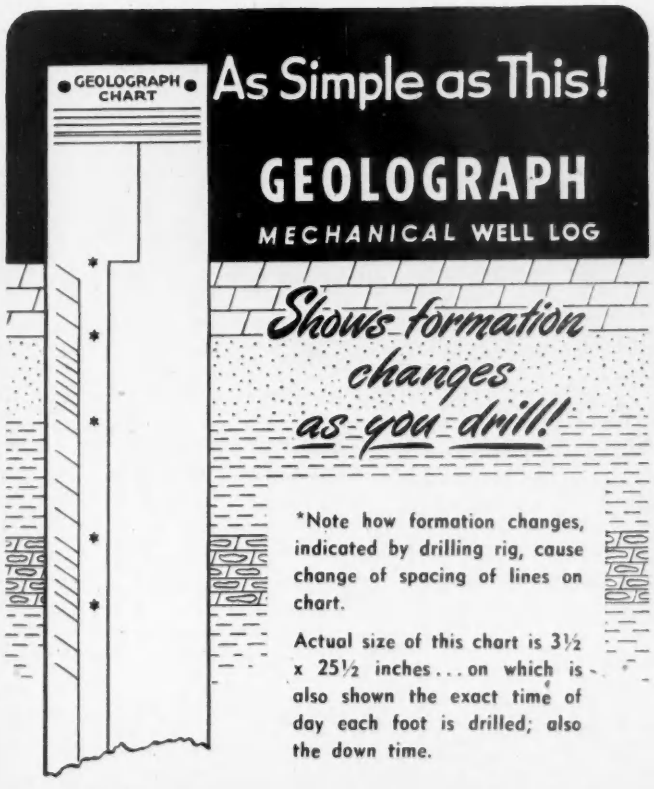
Houston Consulting Firm Formed



John H. Crowell, left, and William E. Steele, Jr., are new partners in the Crowell Consulting Company, specializing in seismograph instruments and interpretation. They have also formed an operating company, Crowell & Steele, Inc., for conducting reflection surveys. Both concerns are located at 3812 West Alabama, Houston. Crowell and Steele, before entering military service, were associated with Independent Exploration Company.

TESCO Offers Prizes

More than 50 Rice Institute senior engineering students will compete for $100 in cash prizes for the best paper on "My Trip Through TESCO" following an extensive tour through Texas Electric Steel Casting Company. First prize from TESCO will be $50, with second and third place papers to get $35 and $15 respectively, said Thomas H. Shartle, president.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As Simple as This!
GEOLOGRAPH
MECHANICAL WELL LOG
Shows formation changes as you drill!
*Note how formation changes, indicated by drilling rig, cause change of spacing of lines on chart.
Actual size of this chart is 3½ x 25½ inches... on which is also shown the exact time of day each foot is drilled; also the down time.
Reasonable rental rates . . . Write for details now
"TIME WILL TELL"
THE GEOLOGRAPH CO.
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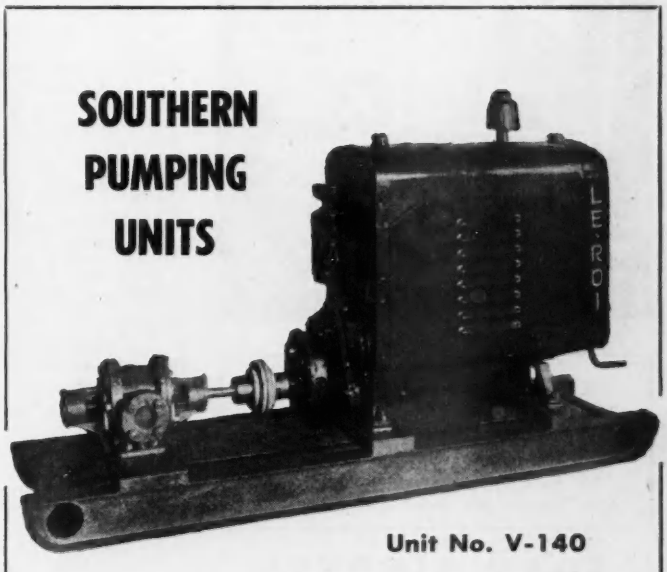
Oklahoma City 4, Oklahoma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Unit No. V-140
Le Roi Power Unit — Viking Pump. Capacity 140 barrels per hour.
Complete units and replacements in Houston and Kilgore stocks.
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Steel Forgings for
CHRISTMAS TREE
FITTINGS
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WELL WORKS COMPANY
BROOKS TODD, General Manager
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BEAUMONT, TEXAS

Two Vice Presidents Are Named By Butler Manufacturing Firm

G. A. Burns, manager of the oil equipment division, Butler Manufacturing Company, Kansas City, Minneapolis, and Galesburg, Ill., was elected a vice president of the company January 7.

Victor C. Norquist, consulting engineer, was also named a vice president. Walter L. Smith, chief production manager, and Arvid A. Schoning, manager of the company's Galesburg division, were elected to the board of directors.

Other officers reelected to the board: E. E. Norquist, chairman; Oscar D. Nelson, president and general manager; Glen C. Speakman, vice president in charge of sales; Fred A. Rufi, secretary and treasurer; Darius Melcher, manager of the Minneapolis division, and Paul G. Koontz, counsel.

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STANDCO BRAKE LINING
Is the driller's best friend because it makes the easiest brake known and "feeds off" evenly while drilling. It never scores brake rims. See page 2808 Composite Catalog.
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